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BBC ACORN USER



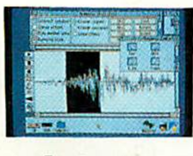
IT'S A DATE
diary program to organise you and your micro for 1990



ARC ART
pictures for the Arc for education and for pleasure



A GOOD IMAGE
choose the right scanner for the BBC micro and Archimedes



REVIEWS
modems, games, wordprocessors, printers, samplers

WORD GAMES
computer conundrums





CLARES

KNOWLEDGE

(or-gan-is-er)

the ability to store *information* and *cross reference* at the touch of a button.

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the ability to store *information* and *access it* at the touch of a button.

processor for consultation or incorporation in the final work. Doctors can add on line data to existing stored knowledge allowing them to stay ahead in a rapidly changing field. Yuppies, throw away your personal organiser, get a Knowledge Organiser.

Lawyers, Historians, Writers, Lecturers, Scientists, Students, Z88 users, everyone who needs to organise, collect, collate and create will benefit from this revolutionary new program.

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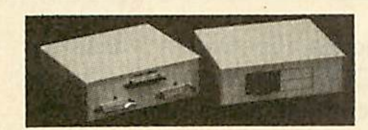
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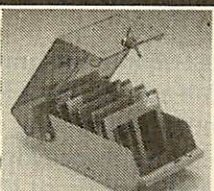
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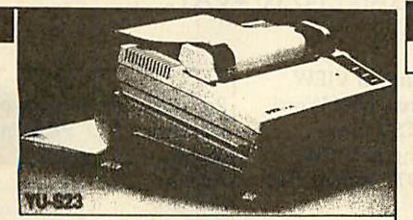
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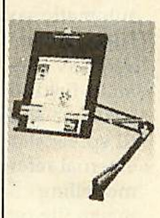


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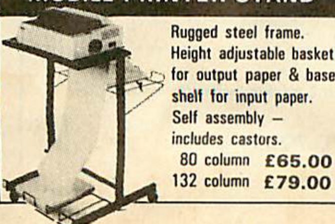


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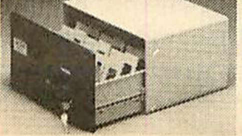
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BBC ACORN USER

JANUARY 1990
ISSUE NO 90

CONTENTS

PICTURE BOX 82





88 INFINITE VARIATIONS



86 RACING AHEAD WITH LOGO



GROWS EDAM 75


Panasonic printers wake up to rave reviews.

GHOST MICRO

The cover story of a recent *New Computer Express* detailing a new Acorn computer has been described by Acorn as complete and utter rubbish.

The story appeared in the issue of *NCE* dated 9th November. In it, *NCE* details a machine based on the BBC A3000 called the A5000.

According to the story, the machine will incorporate the Arm 3 chip and run up to 10 times faster than the A3000, with a price tag of £1500.

NCE claims the information for the story came from sources close to Acorn. Ian Laurence, Marketing Director for Acorn told *BAU* the *NCE* story is 'speculative rubbish based on more rubbish'.



'They've taken an A3000, chucked in an Arm 3 press release together with a vivid imagination and come up with a load of nonsense' he said.

It would seem Acorn users have not taken the *NCE* story too seriously either. According to Laurence the story has not generated a single telephone enquiry to Acorn.

●Acorn is to release an Arm 3 based machine next year and factual information detailing the machine will exclusively appear in a future issue of *BAU*.

MONEY DISAPPEARS AT THE SPEED OF SOUND

Cleveland based Mach Technology has gone into liquidation following the arrests of its two directors, Ralph Masilamani and Ben Larkin.

The arrests in early November followed complaints received by Stockton Fraud Squad from customers who had not received goods, but whose cheques had been cashed.

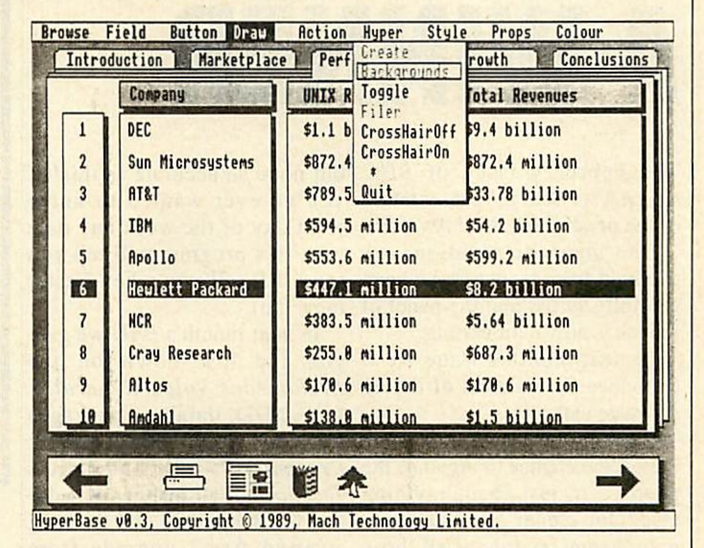
Mach Technology had advertised low-cost hardware and software products in a number of computing magazines, including a 286 PC/AT co-processor board for the Archimedes as well as memory upgrades and hard disc units.

Both directors have been released on police bail after helping the fraud squad with their enquiries. Detective Constable Dave Dixon of the Stockton Fraud Squad told *BAU* 'we do not expect criminal charges to be brought against the directors as there appears to have been no intent to commit fraud. However, my enquiries are still continuing'.

The Mach directors are expected to remain on police bail until the end of January.

The directors of Mach Technology have instigated creditors' voluntary liquidation and at the time of writing a creditors's meeting was scheduled to be held at the offices of the company's accountants, J B Taylor & Company for December 5, at which a liquidator will be appointed.

According to a spokesperson for J B Taylor, 75 customers are owed on average between £500-700, yet a rough estimate of the company's assets only totals £10,000.



J B Taylor also told *BAU* a number of cheques had been sent to Mach Technology which had not been cashed.

Ralph Masilamani, who is currently residing with co-director Ben Larkin in temporary accommodation in Hind Street in Stockton told *BAU*, 'given enough time we could have pulled it off. But we were under pressure to get things out faster than we could.'

When asked why cheques were cashed prior to product completion, Masilamani said 'we thought the money would help in speeding things up but almost all of it went on marketing and advertising costs.'

Asked about the status of product development at the time of liquidation, Masilamani said 'all projects were under development prior to advertising but none were completed.' The exception was *Hyperbase*, a database system which according to Masilamani has now been written.

This directly contradicts what Masilamani told *BAU* in May when he said the Basic 5 and Modular-2 compiler were complete as well as a range of hard disc systems.

When asked about these, Masilamani said 'I don't remember telling you that.'

Masilamani also told *BAU* that around £10,000 - £15,000 worth of refunds have been made and to the best of his knowledge no cheques were cashed for the 286 co-processor, which he claims has been designed but not developed.

BAU reader Gary Sherwood ordered a 40Mb hard disc and 4Mb Ram upgrade totalling £999. His cheque was cashed on August 3. He said 'I am very hacked off about it all. Next time I shall pay by credit card or cash on delivery.'

Customers who have had cheques cashed but have not received notification of the creditors meeting should contact Mach Technology's accountants, J B Taylor & Company at 8 High Street, Yarn, Cleveland.



Editor Geoff Bains. **Assistant Editor** Pauline McLernon. **Technical Editor** Robert Miller. **Editorial Assistant** Christina Neal. **News** David Janda. **Production Assistant** Julia Woods. **Art Editor** Paul Holmes. **Ad Manager** Roger Mullins. **Sales Executives** Richard Power, Duncan Pringle, Joseph Doherty. **Ad Production** David Noakes. **Production Manager** Jennifer Jeffrey. **Managing Director** Ellen Brush. **Publisher** Seamus Geoghegan. **Publishing Director** Michael Potter. **Editorial Director** Chrisopher Ward.



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NEXT MONTH Coming soon to BAU . . .

EVERYONE'S A WINNER

The February issue of *BBC Acorn User* sees the presentation of the prestigious *BAU* Awards.

The many nominations we received from readers have been carefully sorted and the panel of judges is now deliberating.

In next month's issue we'll announce the winners of the 16 software categories.

Also in next month's issue there's the chance to organise the photos – or just about anything else. Our clever *Fotofiler* program keeps records of all those memorable old snaps of happy (or not so happy) events and helps you lay your hands on the right one for the occasion.

And the February issue sees the definitive calendar program. There have been many before but none so accurate as this! If you've ever wanted to know what day of the week any date was, this program will tell you (and it'll tell you when Easter falls, too).

In next month's *BAU* we give you the low down on the *Archimedes Voice Generator* from MJD, database packages for the Beeb, Lingenuity's *Presenter*, Technomatic's *TechnoCad*, all manner of add-ons for the A3000 and the long awaited Arm3 upgrade from Aleph One.

Plus there's the usual blend of the helpful and the sublime with *Eight Bits, Risc Revue*, games, comms, education, music and all the latest news in the Acorn world.



Don't miss the February BBC Acorn User out 11th January

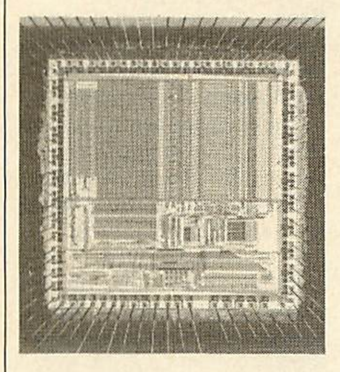
SEEMS ARMLESS

Cambridge based Gnome Computers claims it's selling an Arc Arm 3 board at £100 less than the existing upgrade from Aleph One.

However, Aleph One (which recently dispatched its 100th Arm 3 upgrade) says only it and Acorn have supplies of the Arm 3 in commercial quantities.

Managing Director of Gnome, Mr Steve Temple claimed he would be shipping small quantities of his Arm 3 upgrade in the middle of December. Orders are being accepted now but cheques will not be cashed if stocks are not immediately available.

Commenting on his supplies of Arm 3 chips Temple said 'we



are getting dribs and drabs through one of VLSI's distributors but we have been promised more.'

Keith Pruden of VLSI (which manufactures the Arm 3) told *BBC Acorn User* 'the chip is supplied on allocation with Acorn and Aleph One being the main customers.

Only small sample quantities are being sold by our distributors but the supply will be regular until we manufacture 1 micron version in the second quarter of 1990'.

Aleph One's Alex Van Someren said 'we will not enter a price war with a product which cannot exist.'

More details from Gnome Computers on (0223) 461520. Aleph One can be contacted on 01-252 8044.

BETT 90 PREVIEW

A large number of companies will be featuring products for the Acorn range at the British Education and Training Technology (BETT) exhibition to be held at the Barbican between 17-20 January.

The Concept Keyboard will feature, connected to the A3000 running *Touch Explorer Plus*. The software has been rewritten and updated specifically for the Arc and A3000.

MJP Geopacks, publishers of 54 titles for the BBC micro is to demonstrate a variety of environmental monitoring instrument packages. A four-channel computer weather station for the BBC micro range enables users to monitor temperature, atmospheric pressure, wind speed and direction.

Software Solutions is to launch *Genesis* – a Hypercard type package for the Archimedes which provides a framework for creating pages of linked information consisting of text, graphics, sound and animation. The company will also be showing its range of Econet products.



Technosoft will be demonstrating its range of CAD/CAM software including *Designer* (Arc) which includes user-definable fonts. It will also be showing a new range of high-speed graphic A3 plotters.

Music lovers will be glad to hear Hybrid Technology will be attending BETT 90. It will launch the Music 5000 Universal – a low-cost add-on synthesizer module that provides stereo sound output to any BBC micro program.

Sherston will be demonstrating *Teletype* and *Concept Kids* packages and Resource will demonstrate a number of packages with scientific themes.

British Gas will be on hand to demonstrate its *Labgas* package and SJ Research will show off new email software for Econet systems that can integrate with the Interspan network.

Datacomms fans can check out a series of events planned by Campus 2000 and representatives from the *Healthdata* online database will be showing their information discs.

MORE SUPPORT FOR TEACHERS

Acorn Computers is offering educationalists special discounts on the BBC A3000 and Archimedes 410/1 series.

The Acorn Teachers Support Scheme enables a recognised teacher to purchase their machine with or without a monitor. A cash offer or finance scheme with five per cent interest over 24 months is available.

An A3000 will cost £549 or £779 with monitor and the Arc 410/1 £1019 or £1219 with colour monitor. All prices are ex Vat. Contact Acorn on (0223) 245200 for details.

●The five part series on the new National Curriculum which was sponsored by Acorn and appeared in the *Observer* is now available in booklet form.

The series explains what the introduction of the National Curriculum will mean. The booklet costs £3.95 from the New National Curriculum Booklet Offer, BL Marketing, 88 Station Road, Burton Latimer, Northants NN15 5JW.

NEW LOOK BBC ACORN USER

In case you haven't noticed, *BBC Acorn User* has undergone a major re-design.

The new design gives the Art Editor the flexibility to include more pictures and make articles more attractive while maintaining *BAU*'s unparalleled volume of information.

Logos which identify each of the regular sections have been introduced.

BAU is produced each month on a network of BBC micros and designed on Apple Macintoshes using the *Quark* DTP package.

●*BAU* bids a fond farewell to Paul Holmes, *BAU* Art Editor and the person responsible for the re-design. Paul has been with *BAU* since June 1986 and has left to be pro-active in the freelance market.

MINI OFFICE TOPS HALF-MILLION MARK

Launched in October 1984, Database Software's *Mini Office* has achieved sales of over 500,000 copies.

Mini Office became a finalist in two categories of the British Microcomputing Awards within the first year of release.

It is also the first business



package to succeed in entering the software charts. This is normally the exclusive domain of games.

Further details of the Mini Office integrated software package Database Software, tel: (0625) 878888.

NEWS IN BRIEF

●EMR has opened the first computer music learning centre in the UK.

Based in Southend, Essex it has been set up to provide one day courses for beginners and more experienced users during holiday periods and weekends. For more information contact EMR on (0702) 335747.

●Mitre Software has produced an updated version of its *C-Font* package.

At £20, release 2 incorporates support for release 3 of the Ansi C compiler from Acorn. The package is an easy to use front end for the compiler. Mitre can be contacted on 01-283 4646.

●*Electric Avenue*, the BBC television series on current developments in computer systems is to be screened at 9.25am each Monday starting from January 15 for six weeks.

●Information on the dietary composition of over 200 common foods is now available in the form of a program from WL Computer Services.

Information displayed covers the calorific value of each food, quantities of protein, carbohydrates and fat plus more. The package costs £10.35. WL Computer Services is on 051-256 8685.

●Apologies to Clares for stating the *Render Bender* animation discs cost £10 each in the November issue. In fact they cost £10 for four.

DIARY DATES

17-20 January. BETT '90. The Barbican, London. Contact: Elisabeth Coles, EMAP Exhibitions, 12 Bedford Row, London WC1. *20-22 March*. The Seventh International Conference on Technology and Education, Brussels, Belgium. Contact: Gilliam Esplin, CEP Consultants Ltd, 26-28 Albany Street, Edinburgh EH1 3QH.

CARING COMPETITION WINNERS

The winners of the Acorn Caring Competition, held earlier this year to find the best healthcare software packages for use on Acorn computers, were announced in November.

Dr John Dixon developed a real-time quality control software package for multi-channel laboratory analysers.



Written for the Archimedes, Dr Dixon's system gives an instant up to the minute assessment of current and past quality control for such operations as blood testing.

Dr Hutch Curry developed a spectral analysis program for the Archimedes 310.

The package is a cost effective method of minority background EEG activity in the operating theatre or during intensive care.

The system is designed to be used by both doctors and nurses and requires minimal initial training.

Commenting on the entries, Ian Laurence, Marketing Director at Acorn as well as being one of the judges said 'the final decision was terribly difficult because the quality of all entries was extremely high.'

Both winners will be able to continue their research on Archimedes 420 computers of their very own. They got one each as their prize.

Acorn can be contacted on (0223) 245200.

IMPROVEMENTS FOR ARTISAN

Clares has released an enhanced version of its popular art package – *Artisan*.

Artisan 2 is a full Risc OS application which runs in multitasking mode and enables you to load from and save to other applications.

A number of enhancements have been included in the second edition such as 'sticky' menus which only disappear when an operation is started.

An educational feature enables some features to be de-selected and pattern generation has been added to the package.

A feature called !Spot allows the production of colour separations. These can be produced either as process separations or spot colour.

Artisan 2 costs £60, but existing users of *Artisan* can upgrade for £30. Clares is on (0606) 48511.

DTP OFFER FOR SCHOOLS

Acorn is making a concerted effort to place DTP systems in schools with a special offer.

For £1500 plus VAT Acorn will supply a DTP system consisting of an Arc 420/1 with mouse, colour monitor, Acorn Desktop Publisher and the PC Emulator software.

The offer (for schools only) provides a saving of £600 and if taken up before December 31, Acorn will even throw in a copy of *First Word Plus* as well.

Head teachers can get more information from Acorn on (0223) 245200.

MORE ARCS ON THE ISLE OF MAN

Berwyn Computers is doing its best to make sure that schools on the Isle of Man know all about Acorn 32-bit computers.

The company held a software show in June which was well received by all who attended.

Representatives from Castle Rushen School were so impressed with Acorn's new machine, they discarded a whole network of 19 Apple Macs in favour of an Econet network of 19 BBC A3000's together with filestores.



The school has also taken delivery of a second Econet network to cater for its 12 model B's, Master Compacts and six Master 128's.

The Buchan School for girls is another Isle of Man Acorn-dedicated establishment with eight A310's, five Masters and two BBC model B's.

Berwyn Computers is on (0624) 832204.

Acorn Computers Ltd. is already established worldwide with its high performance quality computer systems and is the only company in Europe to have developed its own RISC processor. We are constantly striving to improve existing products and have an impressive development programme for new products and new markets. As an Acorn user you may have the skills we need to ensure that our programme stays on course.

Over the next few months we are seeking to recruit in the following disciplines to assist us in the setting up of a new development group:

HARDWARE DEVELOPMENT

Including ASIC and systems design and mechanical design.

SOFTWARE DEVELOPMENT

Requiring candidates with experience in UNIX operating system software at kernel, device and graphics primitive level.

DEVELOPMENT SERVICES

Encompassing production and quality engineering, CAD/LAN/WAN administration and component approval.

COMMERCIAL

Encompassing accounting function, facilities and project management/planning.

Ref AU/JHW/016

These are just a few of the opportunities which exist, so applications are invited from candidates whose specialist skills may not exactly match those disciplines described above, but who feel that their experience might be of interest to us.

UNIX SALES PROFESSIONALS

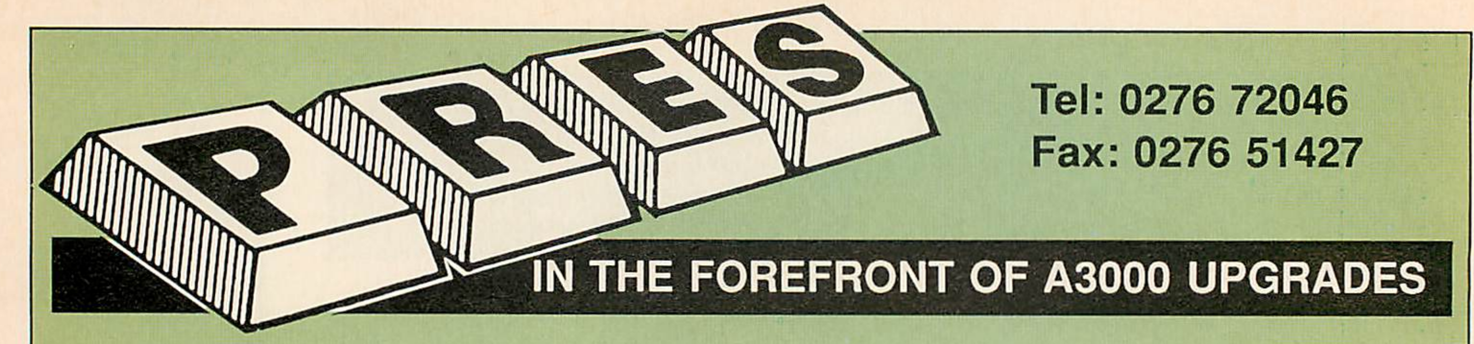
Concentrating on the UNIX personal workstation markets, we seek additional members for our UNIX sales team to further the success of the R140. The successful candidates to join this team will have track records which demonstrate sales success with broad UNIX knowledge across hardware and software applications and networking.

Ref AU/DS/015

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Tel: 0276 72046
Fax: 0276 51427

IN THE FOREFRONT OF A3000 UPGRADES

Pres is committed to providing a full range of compatible upgrades for the Archimedes A3000

The range starts with a carefully thought out monitor plinth 'A3K1' which allows the **A3000** to move freely back and forth making the most of limited desk space. In response from initial users we have also incorporated a way of preventing accidental access to the reset switch. Where security matters it is also possible to fix the plinth to a desk.
A3K1 is expandable to A3K2, a styled housing to take the **A3000** to a system. A3K2 is supplied with a post regulated, switch mode power supply and provides the means for adding up to 2 additional floppy drives (2 x 3.5" or 1 x 3.5" + 1 x 5.25") and a Winchester hard disc drive. All these can be added without having separate boxes hanging from the computer on ribbon cables.

PRES have also allowed for adding standard expansion cards (podules) on the rear of the machine. This is done by means of a casing which attaches and is fixed to the **A3000** case providing full protection for the expansion card. However it does not stop there. The case is expandable to take a backplane and expansion board which can accommodate FOUR mini cards. PRES will release the specification for the mini cards to any third party wishing to have their products on **A3000**. PRES are currently working on a range of Mini Cards, plans include . . . high spec analogue to digital converter, user ROM and battery backed RAM, SCSI, MIDI, 2nd. vdu.

A3K1 Monitor Plinth
£24.95

A3K2 System Housing
£69.50

A3K3 External Podule Case
£14.95

A3K6 Disc Buffer Board
£48.95

A3K7 Hard Disc Upgrade
£429.50
(includes hard disc controller card)

The addition of a 5.25" disc drive is made possible with the Disc Buffer Board (A3K6). It fits inside the A3000 and still allows for the 1MHz bus and user port to be fitted, allowing for maximum internal expansion. A3K6 is supplied with On Board firmware for assigning drive numbers and 40/80 stepping.
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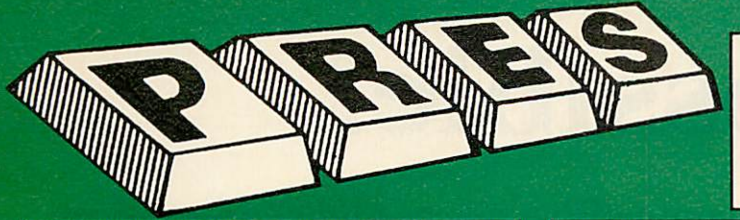
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BAD NEWS FOR HACKERS

Hacking should be a crime - and that's official!

For some time now the Law Commission has investigated the way the law deals with hacking. The Commission has published its findings (which are recommendations) and it's bad news for all of us.

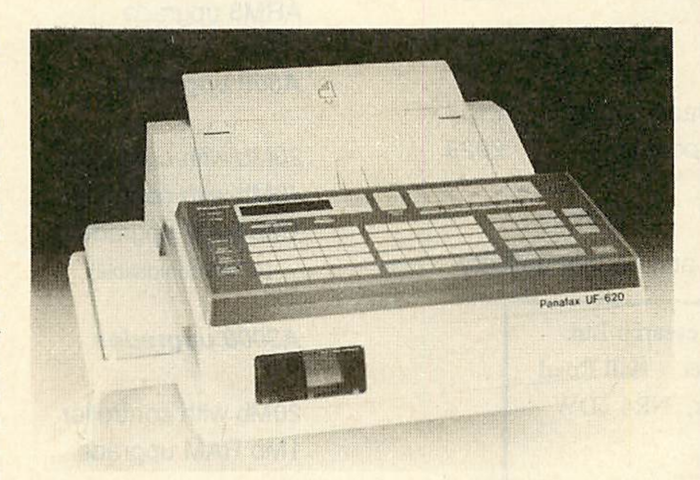
First, the report states that the law is virtually powerless in dealing with some forms of hacking. This is not surprising as British law is outdated in terms of treating information as property – which it currently does not. Not surprisingly the Law Commission has focussed on the entry of computer systems rather than acts carried out within.

The Commission has recommended that all forms of hacking should be made a criminal offence. This includes casual hacking, or hacking for fun.

Casual hacking would be punishable by up to three months imprisonment, while hacking to perpetrate a fraud would be punishable by up to five years. Malicious hacking would also attract a similar penalty.

It's very important to note that the Law Commissions' recommendations are not law – yet. However, should they become law, anyone who uses a modem will have to be more careful. The reason being due to interpretation. Just what is 'casual hacking' and who will be the guilty party? Take the details of the Prestel gateway into Telecom Gold (see News in Brief), which have not been officially published by Dialcom. If the recommendations become law and you enter Telecom Gold via the method I describe will you be committing a crime? Would I for that mater, by publishing the details in the first place?

Having followed the Law Commissions' investigation for some time I've come to the conclusion that the whole issue is one big sad joke. There are far too many loose ends and discrepancies within the report to make it a viable proposition as a basis for legal recommendation. How on earth such anti-hacking laws are to be enforced is beyond me and, I fear, the majority of Police Commissioners in the UK.



There was a time when one could scive off work for ten minutes or so by volunteering to operate the fax machine. There you were standing in line waiting your turn to manually feed in some worthless document which had to be scanned and chucked back at you. Now those spoilsports at Panasonic have ruined things with the introduction of items like the Panfax UF-620. With 1mb of memory for 60 pages there's no excuse for hanging about. Never mind, there's always the photocopier, coffee machine, toilet . . .

If hacking (in any form) is to be made a criminal offence, laws governing the privacy of information will have to be tightened. Prevention in the form of tighter security and access methods is the only effective way to deter hackers of any kind. Any system operator who thinks that a bunch of laws will protect his or her system is a complete fool.

There is no way in which the law is going to police the datacomms networks of this country. By all means let the government introduce laws which punish culprits who have been caught after the act. But if the government thinks the introduction of laws will prevent, or even deter hacking, then the government is in for a bit of a surprise.

POT POURRI

A couple of errors crept into the comms column of the December issue.

First, in the tips on file transfer on Telecom Gold I mentioned Zmodem. This should have read Xmodem.

Incidentally, Xmodem on Gold is available in either checksum or CRC forms.

Secondly, the number listed for CCL4 in the same issue is incorrect. It is (0482) 655798. CCL is based in Hull.

Stop Press! The government dropped the hacking Bill from the Queen's speech. Apparently the Secretary for State for Trade and Industry, Nicholas Ridley dropped the Bill at the eleventh hour as it was 'too complicated in its current form.'

David Janda

●Prestel has developed a viewdata gateway into Telecom Gold. The gateway is on page *77700xx, where 'xx' represents the system number on which your account on Telecom Gold is held on. The index page for the gateway is on *7770000 where a number of help pages are located.

The gateway is available to any Prestel subscriber and means that Gold can be accessed from anywhere in the UK at local call rates.

●Hull based BB CCL4 has a number of additions to its music section. *Addicts Anthem, LA Law, La Isla Bonita, Always On My Mind* and *Three Blind Mice* are in Music 5000 form, while *Hydroxide, The Paranoid Theme* and *Dance of the Icecubes* are available in BBC Basic form.

CCL4 is on (0482) 655798 (1200/75, 300/300).

●According to a BT press release 'Dialcom electronic mail users in 23 countries can now communicate with five million Minitel users in France.' Alas the press release and Telecom Gold (which is operated by Dialcom) fail to tell us how this is done.

●MNP is recognised as the de facto standard for error correction and data compression in modems. Now the war is on as the CCITT which outlines modem standards such as v21, v23 and such like have ratified the v42bis standard.

It does the same job as MNP level five but better (according to the CCITT). Expect intelligent modems to carry both standards for some time to come.

If you have any comms news please send it to David Janda at* BBC Acorn User *Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ or contact him on Telecom Gold 81: RED001 or via Prestel 919992492.



AS NEEDS MUST

Northwest Semerc's recent three day exhibition at the Civic Centre in Oldham was reckoned to have been a great success by everyone who attended and exhibited.

Sponsored by Simnett's, the event was aimed at Special Education users of micros and all their various resources.

Exhibitors from all over the country displayed their wares which included adjustable work-surfaces, alternative input devices, specialised software and a wide range of support materials to meet the needs of many children and adults with physical, mental and learning handicaps.



John Simnett, sponsor of this year's Semerc exhibition, sings a duet with the guest of honour, Sandra Dickinson, as he hands over a cheque for Down's Syndrome research

The event was opened by Sandra Dickinson, the dizzy blonde who played Trillion in Douglas Adams' *Hitchhiker's Guide to the Galaxy.*

Her husband, Peter Davidson (a former Doctor Who) unfortunately had to miss the engagement, for which he had been advertised as the guest celebrity.

Ms Dickinson's opening of the event was largely obscured for many of the younger visitors by the banks of press and television cameras that surrounded her during her stay.

Once they had disappeared, however, she took the time to visit many of the stands and to meet some of the crowds of children who had come with their teachers and parents to the exhibition.

To this observer's mind, this was probably one of the happiest exhibitions this year. Children with many disabilities ranging from crippling diseases to Down's Syndrome were happily engaged in pestering the life out of the exhibitors who were equally happily trying out all their wares on real users.

These were not hi-tech whizz kids with a disdain for all but the leading edge of new technology. The children were keenly appreciative of software which actually met their needs in whatever form and they were totally dismissive of anything which did not come up to scratch. How it did it they did not seem to care.

Martin Littler and his crew at Northwest Semerc had done well to bring together the great and the good from all walks of special education, as well as the computer manufacturers and numerous other interested bodies.

The venue was pleasant, the company good, the food excellent and Sandra Dickinson was . . . well, Sandra Dickinson! Including the voice!

HS SOFTWARE NEW RELEASES

HS Software, the popular Reading and Number software specialists based in Swansea, has released news of new versions of some of its older packages.

These will now run not only on the BBC B and Master but also on the Compact, the Archimedes, the A3000 and, in the case of Reading Packs 1,2,3 and 4, right across the entire Network.

Stuart Forbes, the cheery proprietor of this long-lived company, has created a range of arcade style software which is designed to tackle definite educational issues.

His latest release, *Maths Pack 1*, has been aimed at schoolchildren who are at the National Curriculum Key Stage 1 (5-7 years).

The program features a monitoring facility of a child's use of the software and the disc can hold the data for up to 36 children.

This information may then be graphed either for individuals or for the whole group.

As with all Stuart's packages, there are high-quality graphics and fast action and they are certainly of considerable educational value.

Pity you didn't remember your own address on the handout though, Stuart!

Fortunately I managed to find it anyway, and here it is: HS Software, 56 Hendrefoilan Avenue, Sketty, Swansea, Wales SA2 7NB. Tel: (0792) 204519.

Nick Evans

NEWS IN BRIEF

● LTS has just released *The Role of the IT Co-ordinator*, a book by one Nick Evans designed to help IT co-ordinators in secondary schools come to terms with their changing role in the light of the National Curriculum. It is available from LTS at £4.95.

● The new LTS catalogue of software and resources for education has also just been published. Copies are available from: LTS, Haydon House, Alcester Road, Studley B80 7AN.

● Mitre Software has put together an Education Organiser Pack comprising both a database and a Time manager for use with the Archimedes.

The two component pieces of software are *Flying Start II* and *Timewatch* which are available together at a bundled price of £69.95.

Mitre claims that *Timewatch* can handle up to 2 billion records. It is a manager of appointments and planning which allows the user to structure their time without getting into the complexities of PERT charts.

Mitre Software, International House, 26 Creechurch Lane, London EC3A 5BA.

● *Thinksheet* from Fisher-Marriott Software will now work in a variety of European languages.

This option is available on all copies of the latest version of the software which allows users to structure their ideas and 'provides a flexible scaffolding system to support constructive thinking'.

Previous purchasers may update their master disc free of charge.

Details from Richard Marriott, 3 Grove Road, Ansty, Coventry CV7 9JD.

WIN

A COMPLETE DTP SYSTEM

This is the second part of our exclusive competition. One lucky *BBC Acorn User* reader could be the winner of over £3000 worth of desktop publishing gear kindly donated by Acorn and Panasonic.

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- Acorn BBC A3000 32-bit Risc computer
- Mb Ram expansion
- Acorn colour monitor
- Acorn DTP software
- Panasonic KX-P4450R 11PPM Laserjet compatible laser printer

Last month we published six questions on print and publishing along with a coupon. This month there are three more questions – this time on lasers and laser printers – and another coupon and in the February issue the last three questions and coupon will be printed.

Jot down your solutions and keep them and the coupons safe until next month. You will then have until January 31 1990 to send in all your answers along with the three coupons.

Seal all three coupons inside an envelope and on the back write what you think the correct answer for each question is next to the question number.

Also write your own name and address on the back of the envelope and state which micro (BBC B/B+, Master 128, Master Compact, Archimedes or BBC A3000) you currently own.

The first correct entry out of the editorial hat after the closing date will be the lucky winner of the complete system.

This competition is open to all readers of *BBC Acorn User* resident in the UK excepting employees of Redwood Publishing, Acorn Computers and Panasonic. The judges' decision on all matters concerning this competition is final and no correspondence will be entered into.

THE QUESTIONS

7. In what year was the laser invented?
8. What does the acronym, Laser stand for?
9. Which company produced the first personal laser printer?

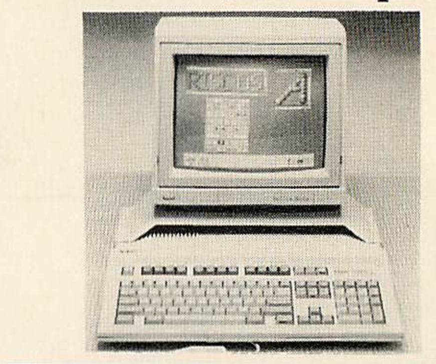


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0264G	420/1 Colour System	1888.00
0275G	440/1 Entry System	2499.00
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310M Colour	132.20	132.00
410/1	145.85	137.00
410/1 Colour	165.20	159.00
420/1	198.85	195.00
420/1 Colour	218.20	217.00
440/1	290.85	287.00
440/1 Colour	310.20	309.00

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SMALL POINT

I was interested to read a review of Mijas *Small-C* by Max Phillips in the September issue of *BBC Acorn User*. The review fails to mention that Mijas *Small-C* is based on a public domain *Small-C* for the 6502 processor that I have been distributing since January 1986.

The compiler is available to users of the Janet network on the National Public-Domain Software Archive at Lancaster University.

I have no connection with Mijas but I gave it permission to sell my code as part of its 6502 assembly language development system.

I also distribute an MS-Dos hosted cross-compiler, primarily to demonstrate the portability of *Small-C* programs written on the BBC micro and to answer some of the criticism of using the BBC micro in education when 'real-world' applications are dominated by the IBM PC.

In the end, programming is programming and the BBC micro is widely available in schools and colleges. Surely we should be teaching the next generation of programmers that open systems and portability are the real issues, not the hardware they happen to be using at the moment.

A J Travis
Banchory
Kincardineshire

MOVING STORY

The report about the NCET/MESU move on page 17 of the November issue may command respect as a work of fiction but certainly not as factual reporting.

Far from going 'against the wishes of DES' in reviewing possible sites for locating the newly created NCET, the Council was specifically required by the Department to do just that.

A considerable number of possibilities were considered in the first instance but most were quickly eliminated. In the end, the choice faced by the Council was between Coventry, Milton Keynes and York.

Milton Keynes was indeed a strong candidate – not because I live there (I don't, I live about 50 miles away) but because of the Open University, particularly its internationally renowned Institute of Educational Technology.

Remember that the NCET is concerned not only with IT in schools, as was the MESU, but with educational technology across the whole range of education and training.

Our location close to the Open University would therefore have had great potential benefit for us and, I venture to suggest, for the OU as well. A move there was not 'averted by the intervention of the Council', as your report states, for the simple reason that, from the start, the work undertaken was with the Council's full knowledge and support.

The choice was not easy to make but the decision in the end to opt for Coventry was certainly influenced by an advantage to Coventry in building costs. This decision, incidentally, has my full support.

Dr N B W Thompson
National Council for
Educational Technology

Not found	Who's had my bottle of malt whiskey?
Bad program	Do you remember when Christmas telly was really worth watching?
Mistake	That's the last time our mother stays with us over Christmas
Can't extend	I knew I shouldn't have had that third helping of Christmas pudding
Arguments	I don't care which Bond film it is, we're watching The Queen's speech
Dim space	What you see in front of you on Christmas afternoon
Escape	Not 'The Great Escape' again
No room	See Can't extend
Too many repeats	See Escape (or 'The Sound of Music')
String too long	Why can't Aunt Ethel wrap presents simply like everyone else?
Too big	See Can't extend
Bad drive	I don't know how we got home from the pub last night
Bad key	...and then we went to the wrong house
Disc fault	Next time you carry your own Christmas shopping
Bad address	The Queen's speech is really dreadful this year
Cat full	All right, who left the turkey out on the kitchen table?

FESTIVE ERRORS

I bet you didn't know your BBC micro had been programmed with a set of special Christmas messages, did you?

Rumour has it that the programming team at Acorn which is responsible for error messages were discussing their work at the office party one year when one member suggested that, as a hidden joke, all the error messages should have a Christmas theme.

This rumour has never been substantiated... until now. As a result of some diligent research, I can at last reveal the real meaning behind some of those intriguing error messages.

Alan Wrigley
Slaithwaite
Huddersfield

LOGO ADVICE

In the Problem Page of the November 1989 issue you answered a reader's query about printing Logo screens in colour with an Integrex printer.

A better solution than the *Master Use Module* which you suggest would be our own *Turtle Worlds*.

This is written specifically for use with Logotron Logo and includes a single keypress screen dump (colour or black and white).

Turtle Worlds also includes a number of other Logo utilities, works with a Concept Keyboard and costs £12.

Chris Morley
Turtle Worlds

In fact, the address given in the November issue for Stour Software was incorrect.

The *Master Use Module* should be ordered from Phobox Electronics, Holworth House, Holworth DT2 8NJ. Tel: (0305) 853767. Turtle Worlds is at 7 Springwood Road, Leeds LS8 2QA. Tel: (0532) 650373.

THE MODEL PROGRAM

Could *BBC Acorn User* help me find programs for model aircraft aerodynamics, or could any of your readers help?

The computer I am using is a Master 128.

Erik Frankel
Denmark

We have not heard of any such programs here but if any readers can help we would be happy to pass on the information to Mr Frankel.

LOST LANGUAGE

My own experience with languages is a sorry one. A few years ago I purchased a copy of Logo (not Acorn's I might add). The manual supplied was 99 percent useless and I never really used it.

As you might imagine, this put me off buying languages for life. Well, until you started the excellent series in the September issue. This has restored my faith in additional programming languages.

Presumably the series was the winning idea in the readers survey competition. Who did win that?

P Hughes
Aldridge
West Midlands

Thanks for the kind words. Actually the languages series was planned well before the competition appeared. We are still poring over that, but the results will be announced in next month's issue.



QUESTIONS AND ANSWERS

Q I have purchased a Star LC10 colour printer. I want to print colour screen dumps. Can you suggest suitable software?

A ESM of Duke Street, Wisbech, Cambs PE13 2AE produces a special colour version of its *ScreenPrint Rom* for the Star LC10

Q I am using the Master 512 upgrade and find that when using my PC wordprocessor the text is always printed on my Epson printer in double spacing although I have not set the program to do this.

I know I could alter the printer's Dip switch settings when using the 512 upgrade but I don't really want to. I cannot get the *FX6 command to work, is there anything else I could try?

A You could try programming the printer so that a line-feed is half its normal height, which would mean that two line feeds would appear as one. Do this from Basic with a program that includes:

```
VDU2,1,27,1,65,1,6,3
```

before the 512 co-processor is actually selected.

Q I would like to make the disc drives attached to my trusted model B function at a higher speed.

I understand that this can be achieved by software rather than altering the links in the keyboard printed circuit board.

A The values following *FX 255 set the relevant bit of the power up configuration byte:

```
*FX 255,255  slowest speed
*FX 255,239  high speed
*FX 255,207  highest speed
```

The remaining bits affect the mode in which the computer powers up and the action of SHIFT-BREAK, so only use the values above.

Q I have a BBC Master 128 and have been experiencing strange ADVAL effects when measuring stable voltage with this machine. Why is this occurring?

A Within BBC Basic the ADVAL command is used to read the digital value that the ADC produces. It is also used for a number of other purposes, but looking at ADC inputs is its main function.

ADVAL returns a value which is actually a 16-bit binary number, although Basic will print it out in decimal for you. The number that the ADC provides is actually only 12 bits long, so the bottom four bits of the 16-bit number have to be all made to zero. The number we get therefore goes up in steps of 16 from 0 to 65520. If we divide ADVAL by 16 we get a number between 0 and 4085.

There is actually nothing wrong with the ADVAL command, it is a 'sad fact of life' that the ADC chip, although it produces a 12-bit number is really only accurate to 9 or 10-bits. One of the reasons for this is the chip produces so much electrical noise that it does not give a constant output even for steady voltage. Try using the following program line as a means of indicating a possible solution to your problem:

```
REPEAT PRINT ADVAL(1)
DIV 128:UNTIL 0
```

This should return a 9-bit number between 0 and 511 (binary 1 1111 1111, Hex&1FF). If it does show a lot of variation consult your local dealer.

The reason for using DIV rather than the normal divide is that we want to return it as an integer. We are not interested in any figures after the decimal point. In fact ADVAL(1) DIV 128 is equivalent to INT(ADVAL(1)/128) but this is a longer way of working out than using DIV.

Q I have an Epson RX printer which I use with my Archimedes 310. I understand from Clares Micro Systems that although my RX-80 is FX-80 compatible it will not dump pictures I have created with *Artisan*.

A Clares originally said that *Artisan* would not dump *Artisan* pictures to an Epson RX-80 printer. However it has now produced a useful help sheet that gives a set of pokes that will enable you to print with your printer.

Q I have just purchased the PC-Emulator for the Arc and am appalled at the documentation. I am familiar with ADFS and don't understand MS-Dos very much. Can you give some help with the commands and recommend a simple book?

If you have a problem with an Acorn micro, commercial software or a program you are trying to write then *BBC Acorn User* can help. The Post A Problem service guarantees to give you a personal answer within 10 working days for just £4.

Write out your problem with as much detail as possible and, if a program is involved, include a disc or cassette. Fill in the coupon at the bottom of this page and send it and your problem along with a cheque or postal order for £4 (including VAT) made out to Redwood Publishing. If you want recorded delivery add on the cost of this.

Please note that debugging readers' own programs or those from other magazines is a complex task and we cannot guarantee to give a full solution. Unless the problem can be spotted quickly, the Post A Problem service will only be able to make general comments. The service will answer the problem and return all material received within 10 working days of receipt. If we fail to match this promise then your cheque or postal order will be returned – you can't lose!

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A MS-Dos is hierarchical like ADFS, and most of the operations are analagous, but with different commands and characters. Here are some command conversations

ADFS	MS-DOS
*CAT	DIR
*DIR	CHDIR (CD)
*CDIR	MKDIR (MD)
*RENAME	REN
*DELETE	DEL
*COPY/MOVE	COPY
*BACKUP	DISKCOPY
*FORMAT	FORMAT
*TITLE	LABEL

The \ character is used for two purposes, one to represent the root directory like $ in ADFS and as a separator in file paths like the full stop in ADFS

You may find *Using MS-Dos on the Amstrad PC* by Ian Sinclair published by Heinmann a useful guide to get you started.

Q I want to install a large scale application software package into the PC-Emulator. I am confused by the menu of hardware options presented to which the software will configure itself correctly to. Can you guide me through the responses I need to make.

A When installing your application try these responses:

Graphics	CGA
Keyboard	USA
Floppy Drive	1 or 2
Hard Disc	1 or 2
Printer Port	LPT1:
Serial Port	COM1:
Mouse	Bus Mouse (MOUSE.COM)
8087	Not fitted

Q I have a BBC model B which I have not expanded, except I have added a few Roms into the free sockets inside the machine.

As these are now full I would like to purchase a Rom expansion board. Which one should I buy?

A There are a number of different types of Rom boards available. But from what you say I think you will be happy with the type that offers another 12 Rom sockets and the facility to have up to 16K of sideways Ram. The Watford Electronics Solderless Rom board and the ATPL Rom board are probably the best of this sort.

Q I use *Wordwise Plus* for all my wordprocessing tasks. Is there any way by which I can prepare text in two or three columns for script writing where the text has to relate horizontally across the page?

A You need to purchase a copy of *Videoscript* from Norwich Computer Services. This is a program written in the *Wordwise Plus* language which is loaded into one of the segments. It is reasonably priced at £10 and should be ideal for your task.

Q Which versions of the Basic language will run on the Master 512?

A A 'freeware' version of BBC Basic specially created by Richard Russell for the Master 512 is available on receipt of a formatted disc from Beebug.

M-Tech's *BBCBasic (86)* also provides a very BBC Basic like environment. Microsoft's *QuickBasic 3.0* also works well on the Master 512. *GWBasic* works to a certain extent but there are problems with printing. Borland's *Turbo Basic* and Locomotive Software's *Basic 2* do not work.

Q I am a frequent user of *View* on the BBC Master 128. I can find no reference in the Master Welcome Guide about how you redefine the foreground and background colour screen displays.

A It is possible to set up various colour screen displays in *View* quite easily. You do this from within the command mode by pressing CTRL-S followed by xy000 where x represents the logical colour in the selected mode (foreground or background).

In mode 3, x would be 0 to change the background, 1 to change the foreground. The letter y represents the physical colour you want. For example to change the background in mode 3 to blue you would type CTRL-S 04000.

ACORN CUSTOMER HOTLINE

Acorn has released a disc of updated and new applications for use with Risc OS. The applications include a new !Printer!DM and !PrinterPS along with two new !PrinterIX printer drivers for Integrex printers and !PrinterLJ for Hewlett Packard and compatible laser printers.

Other applications include a new !65Host which has been substantially improved. This now incorporates full BBC sound emulation, printing, DFS directory structure emulation and speed improvements.

The other utilities are mainly new modules including new Econet modules for use with Econet networks. The new and extra applications can be obtained from either SID or from your local Acorn dealer.

Please contact your dealer as there may be a small service charge for downloading this software. Acorn cannot supply these applications directly.

●Acorn has also recently released the long awaited new Master 128 operating system. It contains many improvements over the present operating system including extra commands, extensions to existing commands, a relocator to use with programs run under the 6502 second processor, increased speed in some areas and extended 8-bit character handling for foreign language use.

It should be noted that although the new software is highly compatible with existing software applications, it is not 100 per cent compatible due, in particular, to the 8-bit extended character handling.

For this reason, we suggest you contact the manufacturer of existing third party software you wish to run under the new operating system to ensure it will run correctly. This upgrade is available from your dealer for £39 plus VAT.

●The new Risc OS programmer's reference manuals are now available.

Acorn has been offering an upgrade from the Arthur PRMs to the Risc OS PRMs. The new PRMs come in four volumes with a separate index book.

The RRP for the new PRMs is £79 and they can be bought from Acorn approved dealers. The upgrade is £55.20. Please contact Customer Services for an information sheet which contains details on how the upgrades are being processed. Please do not send the old manuals to Acorn before receiving the information sheet as this facility is being provided by an outside contractor.

The upgrade offer is available until 31 March 1990.

●Acorn is also offering upgrades from releases 1 and 2 of Archimedes Ansi C to the latest Ansi C release. Everyone who registered their C package with Acorn should by now have received notification directly about the offer.

For people who did not register or have not received any information, contact Customer Services for further information about the offer.

The upgrade price is £75.20 from release 1 to release 3 and £55.20 for release 2 to release 3. Please note the price given in *BBC Acorn User* December issue is incorrect.

The upgrade offer is available until 31 March 1990.

●A new version of *First Word Plus* which works in the desktop environment is now available. For present users of stand alone systems and education users who have licence agreements. Acorn will be offering an upgrade from release 1 to release 2.

Acorn Customer Services can be contacted at Acorn Computer, Fulbourne Road, Cherry Hinton, Cambridge CB1 4JN.



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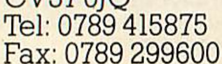
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from 4MATION for the Archimedes with screens by Rodney Matthews

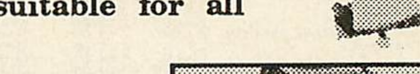
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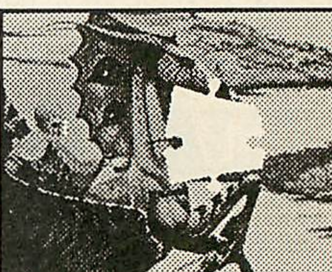
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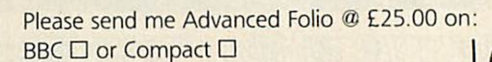
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U.I.M.

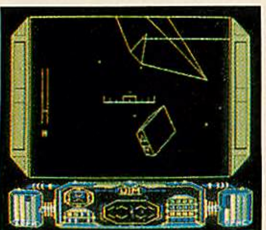
U.I.M. is a massive 3D arcade adventure set in the future. 2 1/2 years of dedicated design and programming have produced this massive game. The "greenhouse" gases melted the icecaps and all life now exists in the oceans. There are over 65000 underwater ports each with their own colonies.

You must travel the oceans, trading in commodities, shares and currency. There are over 250 missions to complete before you will find your goal - the U.I.M. - created to be almost a god! Your craft is a highly manoeuvrable (and expandable) futuristic submarine named Black Satyr.

On your travels you will encounter many submarine types. Many of the most advanced and aggressive submarines do not appear until you reach later networks of ports. In addition you will also meet the Replicants - man-made underwater machines which have gone "renegade" and are capable of reproduction.

As you progress it is therefore essential to avail yourself of the highly sophisticated range of combat and defensive equipment available. The quest for the U.I.M. will be long and involved, the dangers intense, but the reward priceless!

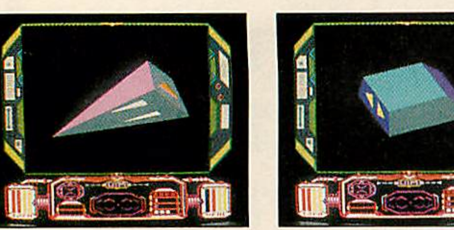
U.I.M. is disc only and will run on BBC B or B+ with 16K of sideways RAM, BBC Master series and all Archimedes Computers.



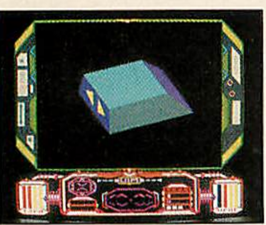
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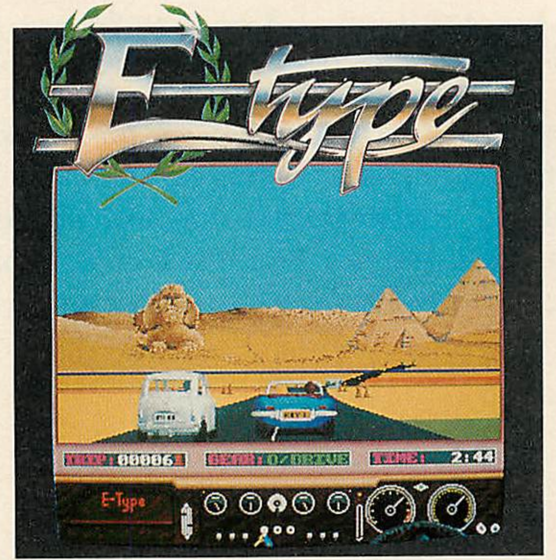
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E-TYPE

Take control of £70,000's worth of gleaming "E-Type" and head off for the drive of a lifetime. Hear the digitised roar of the 5.3 litre 12 cylinder engine as you tear along lanes, motorways and desert tracks at over 150 mph.

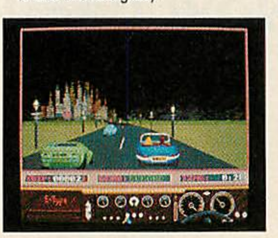
"E-Type" takes racing simulations into the world of 32 - bit RISC processing and gives you smoother, faster and more detailed graphics than you are even likely to see in the arcades.

If you're new to driving you can take the easy-to-drive automatic for a spin but experienced drivers can optimise their performance in the faster 5 speed manual "E-Type". There are hazards galore including other cars, roadworks, trees, rocks, bushes, billboards oilspills, etc. etc.

"E-Type" has been produced by the highly acclaimed and experienced Gordon Key who also produced the best-seller Holed Out.

E-Type Designer

Design your own "E-Type" tracks with this highly advanced but simple to use designer. It is enormously flexible to produce an endless variety of tracks to challenge you and your friends. (N.B. You need the original E-Type in order to use this designer).



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WHITE MAGIC

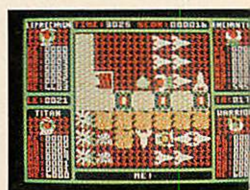
White Magic is a unique arcade adventure in which you control 4 varied adventures:-

Kaldor the Leprechaun, Cheysul the Titan, Moriana The Warrior and Mandrake the Enchanter.

You can transform between all 4 characters at will and use their much needed special abilities.

It features 32 massive action-packed levels filled with aggressive guards and trolls, haunting ghosts and spectres, curious objects to find and use, and much more .....

White Magic is not a game for the faint-hearted; it is a fast-action game which requires fierce hand to - hand combat and frantic weapon fire.



BBC



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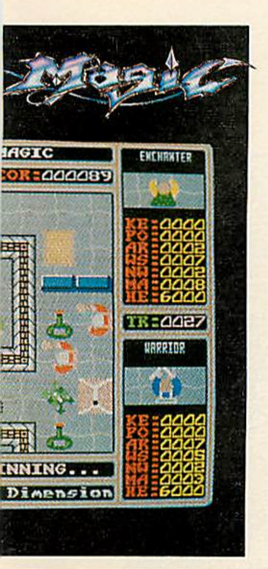


PRICES AND AVAILABILITY	ARCHIMEDES 31/2" DISC	BBC B/MASTER 51/4" DISC	BBC AND ELECTRON CASSETTE	MASTER COMPACT 31/2" DISC
U.I.M.	29.95*	19.95	-	21.95
E-Type	19.95	-	-	-
E-Type Designer	16.95	-	-	-
The Olympics (6 Events)	19.95*	-	-	-
White Magic	19.95	12.95	9.95	13.95
White Magic 2	19.95	12.95	9.95	13.95
Holed Out	19.95	14.95	12.95	15.95
Holed Out Extra Courses 1	16.95	11.95	9.95	12.95
Holed Out Extra Courses 2	16.95	11.95	9.95	12.95
Holed Out Designer	19.95	-	-	-
Arcade Soccer	19.95	12.95	9.95	13.95

*The Olympics and U.I.M. Archimedes versions due for release 5th December, 1989.

DIMENSION





WHITE MAGIC 2

This includes 32 brand new and highly dangerous levels plus a complete level designer.

The level designer is a doddle to use and can be used to alter or design levels from scratch.

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Reviews of White Magic

"The graphics are superb .... An absolute winner"
Electron User Golden Game August '89.

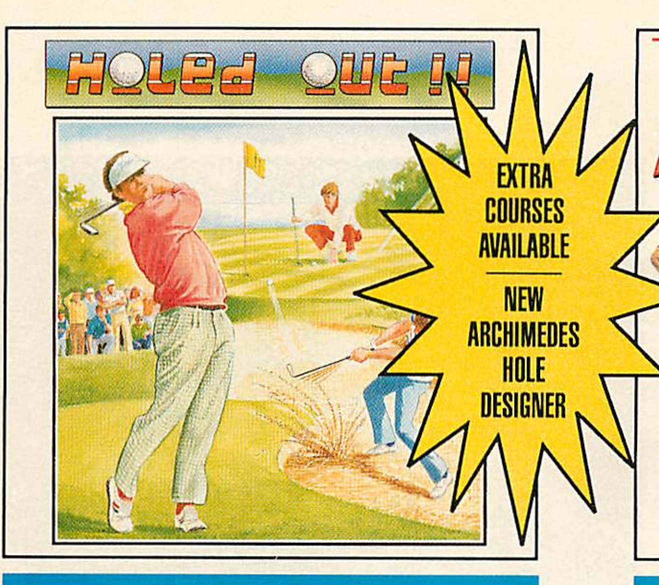
"Playability is good and I had to tear myself away in order to write this update review."
Archie review - The Micro User, October 1989.



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HOLED OUT

The most comprehensive, realistic and highly acclaimed golf simulation on the market today. This volume contains the original 2 contrasting 18 hole courses and comes complete with an easy to follow 16 page manual.

"I play golf and this game is the closest thing I've seen to the real game on a computer". *Archive, June 1989*

"I wouldn't have thought it possible to get a better simulation out of the beeb". *BBC Acorn User, June 1989*

"The 3D perspective graphics are stunning". *Electron User GOLDEN GAME June 1989*

"Holed Out is great ..... The game plays very well and the graphics are superb". *Popular Computing Weekly. March 1989*

"The Electron version is brilliant - it's almost the same as playing at Gleneagles. Unreservedly recommended". *A & B Computing Game of the Month, June 1989*

HOLED OUT EXTRA COURSES

In response to your many requests we have now produced 2 volumes of extra courses. Each volume contains 2 superbly designed brand new courses plus the original Holed Out program; therefore you do not need the original Holed Out to play them. Each course has been meticulously created to test your golfing abilities to the limits. The holes are very varied and even Nick Faldo would need to use his skills to keep up his recent record.

ARCHIMEDES HOLE DESIGNER

Create your own golf courses with this easy - to - use yet highly sophisticated hole designer. Its flexibility allows you to define all aspects of the holes from their pars to the position and size of the lakes. It will keep you enthralled for years.



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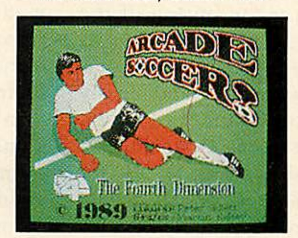
ARCADE SOCCER

Arcade Soccer really is football action at its very best.

Using an overhead view to make game play as exciting as possible it features everything that you could want in a football game. Corners, sliding tackles, throw-ins, goal kicks, dribbling, shooting, passing and much more. But not only does Arcade Soccer give you Total Action it also puts you in Total Control.

Firstly you can play with either keyboard or joysticks, against the computer and/or with up to 23 friends. The options are almost limitless; you can choose the skill of the goalkeepers, the speed and length of the game, play "friendlies" or tournaments and even enter the most coveted of championships - the World Cup.

"The game is very playable and you do get a feeling of involvement as you knock the ball into the corner of the net straight past the diving goalie. It's definitely one to play again, and if you've enough friends it could make for a good day of enjoyment - and not a lot of games can do that. Value for money ... 10 out of 10". *The Micro User, October "89.*

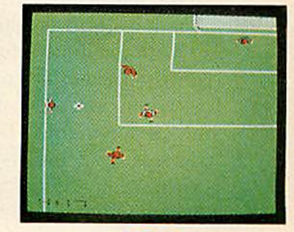


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RISC REVUE

£35 THE ONLY GAME IN TOWN

We kick off the Christmas Revue with a Risc OS version of a classic puzzle. David Andrews of Cumbria has supplied us with a desktop Solitaire and earns himself the special festive rate of £35 for his trouble.

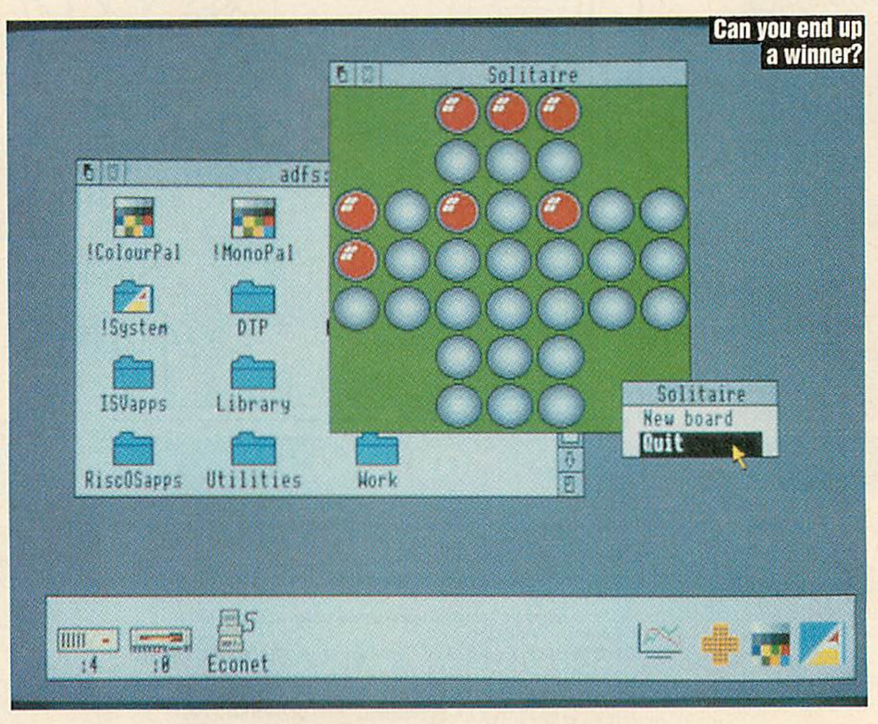
As regulars will know, Risc OS applications come in the form of directories containing several files. Listing 2 on the yellow pages (DataC) creates the directory !Solitaire (in a specified place, $ by default) and puts in it the various sprite and command files required. Listing 1 is the main Basic program and should be saved in !Solitaire as !RunImage. When ready, enter the desktop and click on !Solitaire. After a short delay, the Solitaire icon appears on the icon bar. Click on this for a new game.

Moves are made by dragging the desired piece to its destination hole. You can only move by skipping over a piece vertically or horizontally and the piece that is jumped is removed. The object, of course, is to be left with a single piece in the centre of the board. To select a new board, or kill the application use the menu button of the mouse.

Listing 2 creates four files in all. !Boot is a typical application boot file and simply adds the Solitaire icon to the sprite pool. !Run is again quite typical and includes a *wimpslot command to set aside 24K for the main program. !Sprites consists merely of the Solitaire icon and Sprites contains the definitions for a filled and empty hole. If you'd like a closer look, load these files into *!Paint* or *!Edit* as appropriate.

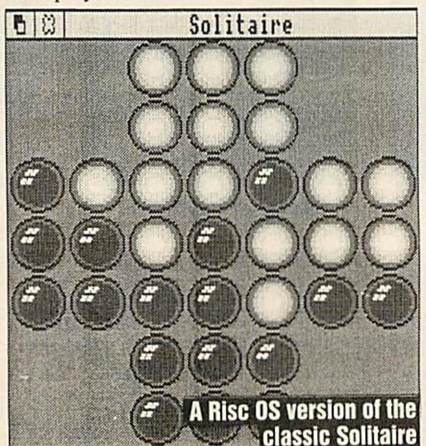
Let's examine a few of the crucial parts of !RunImage. The program starts off with a 'Wimp_Initialise' call and passes to it a block containing 'TASK' to tell Risc OS that we're a multi-tasking application. Then, the Solitaire icon is added to the icon bar using the call 'Wimp_CreateIcon'. Note that to place icons on the right-hand (utility) side of the icon bar, the first word of the block passed to 'Wimp_CreateIcon' should contain -1. Left-hand (filing system) side icons are placed using -2 instead.

The sprites used on the main board are loaded with an 'OS_SpriteOp' call and the main Solitaire window is created by calling FNwindow. You'll see most window definitions in the form of template files, but here a window is made by manually setting up the definition. 'Wimp_CreateWindow' actually creates the window and a handle is returned which is used thereafter for opening, closing and all other operations.



Can you end up a winner?

PROCnew_board sets up the board (from the data at the end of the program). The menu is created by FNdefine_menu. It seems everyone has their own approach to menus. In general, programmers seem to prefer to define menus as strings. These are then decoded and the resulting data placed somewhere safe for use by 'Wimp_CreateMenu.' When menus might change depending on circumstances, it often helps to split the menus into two parts – 'fixed' and 'variable'. The variable part must be redefined each time the menu tree is displayed.



A Risc OS version of the classic Solitaire

At the heart of Solitaire, like all applications, is a polling loop. In this case, FNreason calls 'Wimp_Poll' and returns a reason code describing what to do next. Only some codes refer to Solitaire.

Codes 2 and 3 appear when windows need to be opened or closed respectively. Code 6 arrives when a mouse button has been pressed. PROCmouse_button decides what to do – whether to open a menu, open or reopen the board window, or start the process of dragging a piece to a new hole. Drag-boxes are created by calling 'Wimp_DragBox' and when the box is deposited at a new place, reason code 7 is returned. This invokes PROCdrag which sees if the move made was valid. If so, the board is re-drawn by PROCdraw_board and 'Wimp_ForceRedraw' is called to ensure the main window is replotted. The holes and pieces of the board are icons and so are dealt with by the operating system.

The only remaining reason code recognised by Solitaire is code 9 or 'menu select'. PROCmenu_select deals with this and only two menu options are available – 'New board' and 'Quit'.

Errors are handled by PROCerror which passes the error string to 'Wimp_ReportError.' This brings up an error window containing the message and one or more buttons. This call takes in R1 a number of flags – for example: bit 0 means 'provide OK box' and bit 1 means 'provide Cancel box'.

Thoughtful use of this SWI means you

can provide warnings as well as reporting actual errors.

Solitaire is a good example of applications (as well as a good puzzle). If you've written an application you think might appeal to other readers then why not send it in? Revue can only cater for the smaller ones, but there's plenty of scope in the rest of the magazine for larger examples.

£5 PERFECT COMPETITION

Well, not so much a competition as a gentle challenge. You'll recall after the prime numbers of November's Agora, Nigel Mason suggested that the calculation of the first few 'perfect' numbers might prove more of an intellectual challenge. As you probably know, a perfect number is any whose factors (or aliquot parts, as *Chambers* calls them) add up to itself, for example, 28=1+2+4+7+14

Well, I've had a couple of excellent replies to the challenge – from Andrew Pepperell of Louth and David Smith of Warrington. Both make use of a rather nifty formula which, David Smith informs us, was proved by the mathematician Euler.

Apparently, all even perfect numbers can be expressed as 2^(n-1)*(2^n-1). For this to be perfect, 2^n-1 must be prime and thus n must itself be prime.

So, the problem is reduced to one of skipping through the primes (n=2, 3, 5 and so on) and seeing if 2^(n-1)*(2^n-1) is perfect. This reduces the amount of calculation required to almost nothing!

David's solution is listing 3 on the yellow pages. In fact, the first four perfects can be found with n=2, 3, 5 and 7 and the program makes use of this fact. Andrew's program is listing 4 and this plods on until the numbers it produces get too large. Impressively, the fifth perfect number (33550336) is found in a little over a second.

A fiver is on its way to David and Andrew. And of course, if you can think of a mathematical challenge to keep our readers thinking for more than a few seconds, why not send it in?

£10 DISC-INFECTANT

Here's a neat trick from R Corderoy of Worthing. It concerns the limitations of the CASE statement. Normally, only single values (or small collections of them) can be dealt with, viz:

```
CASE key OF:
  WHEN ASC"A":REM whatever
  WHEN ASC"B",ASC"C":REM whatever
  WHEN 127:REM whatever
ENDCASE
```

It's often useful to check for ranges though, but the only way to do this is to resort to the old-fashioned IF:

```
  IF key>=32 AND key<=126 THEN REM
whatever
  IF key=127 THEN REM whatever
```

Unless you tack GOTOs on the end of the IFs, however, a lot of unnecessary comparisons have been made. Mr Corderoy's solution expands the CASE statement rather cunningly:

```
CASE TRUE OF
  WHEN key>=32 AND key<=126:REM
 whatever
  WHEN key=127:REM whatever
ENDCASE
```

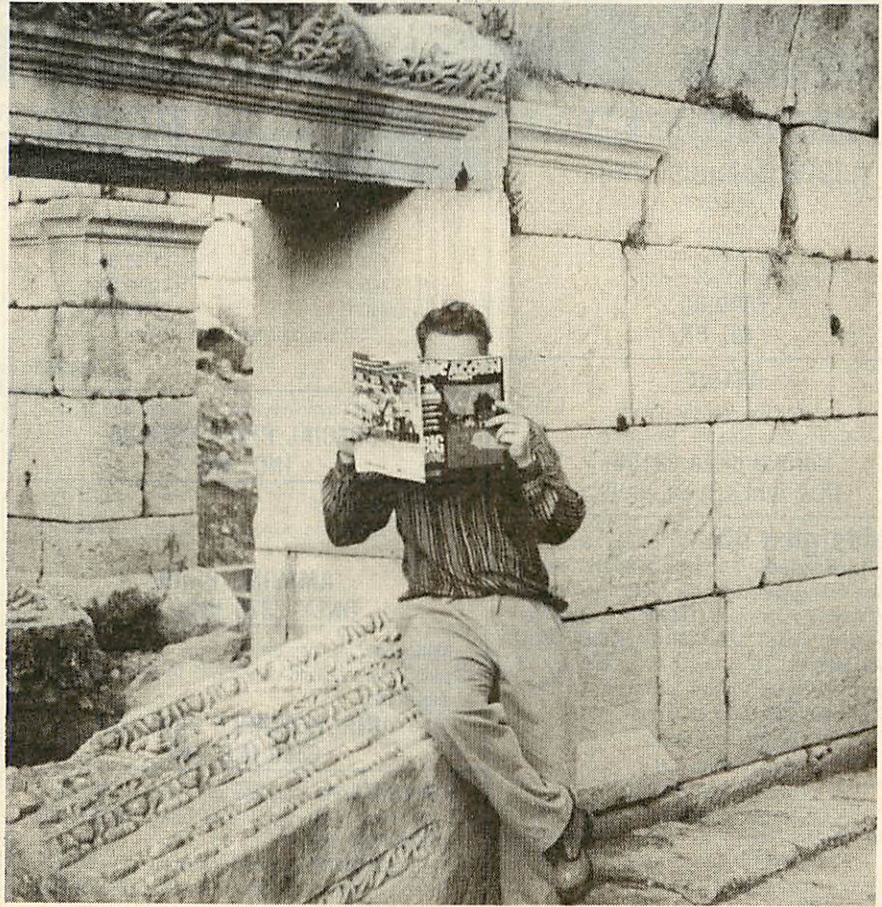
Each WHEN is evaluated until one proves to be true. It's a good way of keeping your programs tidy and I'm sure I'll be using it in the near future.

£10 CASE STUDY

There are many stories about people getting data from discs that have been mistakenly left behind. The trouble is, deleting files only removes their names from the catalogue – unless the data itself is physically overwritten, it can be retrieved by anyone armed with a disc-sector editor.

A solution comes from regular Terry Blunt. His program is listing 5 on the yellow pages and performs two tasks. First, the disc is fully compacted. This is done using 'ADFS_FreeSpace,' which returns the total amount of free space on the disc and the size of the largest free block (in R0 and R1 respectively). When these are equal, the disc is ready for stage two. This consists of creating a dummy file to which zeros are written until the disc is full. Then the file is deleted and the disc is 'clean'.

So, run listing 5, enter the drive number and wait for the all clear before entrusting your disc to potentially prying third parties. Alternatively, format a blank disc and copy onto it only the files you wish to send. In these days of hackers and viruses, I suppose it's better to be safe than sorry...



Arc Agora has changed its name to reflect these changing times. When the intrepid BAU editor finally found a real ancient Greek agora at Kaunos in Turkey, there were absolutely no Arcs to be seen – only a few ruined columns and friezes. So, in total disgust (and what with the advent of the BBC A3000 and because nobody seems to know what an agora is anyway) we've come up with Risc Revue.

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EIGHT BITS

Yes, you've guessed it, the old look Hints and Tips are gone – but DAVID ATHERTON continues to provide 8-bit Acorn micro owners with the best advice

£10 SCROLLING TEXT IN MODE 7

Graham Hammell from Stockton-on-Tees has submitted a good version of an old idea, that of a mode 7 scrolling text program, and he gets £10 for his trouble.

The nice thing about this program is that it is completely self contained. Although you can run it from within another program, you don't need to integrate his lines of code with your own. This makes it very easy for programming novices to use.

The program when typed in from yellow pages can be run directly. The way it works is to generate a machine code program which performs the scrolling totally independently of anything else that your program may be doing.

This means, for example, that you could have text scrolling across the top of the screen, while text input, other animated items or general calculations are being performed at the same time.

To use the program, you must first have a text file prepared in a wordprocessor such as *Wordwise* or *View*. It is this text file (which can be anything from one word to several hundred) which is scrolled continuously across the screen.

When you have created your text file, save it to disc. Then run Graham's program. First you will be asked for the colour of the message. Scrolling is always done in double height text, in a single teletext colour, which can be any of the usual range.

Next you are asked for the start X coordinate. If you imagine the scrolling area to be a rectangle on screen always two characters high (double height) but of variable width, this is the left hand boundary. A value of two is a full screen scroll. Next the Y position is requested. A value of 0 will print the message across the top of the screen, a value of 23 across the bottom.

The length of the scroll is the next question. The maximum value offered here depends on the answer you gave to the X position but entering the maximum causes the right hand side of the scrolling rectangle to be the right hand edge of the screen. To keep the scrolling area centred, the answer to this prompt should be 40-2*X value.

The program then asks for the speed of the scroll. This determines how fast the characters move across the screen, and values of 1 (fast) to 50 (slow) are acceptable. The number is the amount of delay in fiftieths of a second before the text moves along one position. You will need a low value probably between one and four if the text is to appear truly animated.

```
10REM Scrolling creator
20REM by Graham Hammell
30REM for B/B+/M/C
40REM (c) BAU Jan 90
50:
60MODE 7
70HIMEM=TOP+2000
80PROCinit
90PROCass
100PROCsave
110END
120:
130DEF PROCinit
140CLS
150PRINT"Please enter the text colour
"160PRINT"1 - Red  2 - Green  3 - Yell
170PRINT"4 - Blue 5 - Purple 6 - Cyan
180PRINT"7 - White"
```

A good version of an old idea

* BBC ACORN USER 1990 - EIGHT BITS *

Finally you are asked for the name of the text file to be scrolled. This is the name you gave to the *Wordwise*, *View*, *Edit* or whatever file contains your message. The text file which holds the message does not have to contain it all in one line. Carriage returns are simply converted into spaces.

The program then makes a machine code program, which includes the desired text within it. When this is done, you are asked for a filename under which to save this machine code. The program closes by reporting the value which your controlling Basic program should give to HIMEM. This is to ensure that the Basic variables used by your own program do not corrupt the scrolling code.

If for example, the program reports that HIMEM should be set to &7100, then the first two lines of your own program which incorporated the scroll should be:

```
10 MODE 7
20 HIMEM=&7100
```

To use the program in it's simplest form, type in the above two lines followed by:

```
30 *RUN <filename>
```

where <filename> is the name you have given to the machine code program. This will activate the scrolling message.

You will notice that your Basic prompt also returns. If you add additional lines of code after line 30, you will notice that these are also executed, while the scrolling continues.

This is where the real benefit of the program occurs. Line 40 could for example be an INPUT statement, or some more messages. None of this will affect the scrolling.

If during the course of your program, you wish to stop the scrolling, use the command *FX13,4. If you want to turn the scrolling on again, then if you have not changed mode or altered the screen area to the left of the scrolled text position, issuing the command *FX14,4 will turn the scrolling message on again, at the point where you left off.

If you need to change mode, then you must turn off the scrolling with *FX13,4 before doing so. Changing mode will corrupt the scrolling program, so to restart it, you must first reselect mode 7, and then *RUN the program again.

There is no reason why you could not create two text message scroll programs using the generator program and stop one with *FX13,4 then *RUN the other one.

If you clear the screen or otherwise alter the contents of the two character spaces preceding the scrolled message, the message will lose its colour and double height attributes. To avoid this, it is a good idea to run the rest of your program in a text window defined with VDU 28 so that the scrolling part is safe. Note the characters are written directly to screen and so are not affected by VDU windows.

The program works using the frame fly-

back event which occurs every fiftieth of a second. Each time frame flyback occurs the program is called and the delay counter is decremented. When this reaches zero, the text is reprinted, starting one character on from the last time.

The printing is done by direct screen poking, the position being determined at assembly time by the co-ordinates given in the introductory dialogue.

This carries on indefinitely. When the end of the text is reached, a few full stops are displayed, and the cycle starts again.

*FX13,4 is the command to disable the frame flyback event, so naturally this stops the program from being activated. At this point, the operating system doesn't care whether the program is intact or not as it is not being executed.

The event vector does contain the address of the routine, so if a *FX14,4 command is issued, the event is re-enabled, and a jump is made to the address of the program. If it is not there, the machine may crash. Of course if you *RUN the program again, this will ensure everything is correct. When the program is *RUN it sets up the event vector again, and issues a *FX14,4 call. This program can be used for general purpose display programs, for example, if a program already exists which displays information in mode 7 then, providing you have a couple of lines free on the screen to fit the scrolling message, it can be incorporated without altering the main code at all.

£10 MASTER 512 HARD DISCS

Andrew Rawnsley from Peterborough has a Master 512 board with an Oak Computer's hard disc, and he wanted to partition the drive so that part of it would be ADFS Drive 0, and the rest Dos Plus Drive C.

As many 512 users will know, there is a program on the 512 Disc 1 which creates such partitions. This program however, only offers default partitions of 4, 10, 20 or 30 megabytes.

Incidentally, if you choose, say, a 20Mb partition on a 20Mb drive, the way the system counts means that provided there are a negligible number of defects on the drive, there will usually still be a small amount of room (a few hundred K) for ADFS files. You always need a little bit of room anyway, as the DOSBOOT file which loads up Dos is an ADFS file.

Anyway, Andrew wanted a couple of megabytes for ADFS, so he decided to attempt to produce a different size of partition–18Mb to be precise.

The Dos partition system works by ADFS creating a very large file on the hard disc which is always called $.DOS.DRIVE_C. Having this large file there reduces the space available to ADFS.

When the 512 software is booted up, the internal Dos Plus code finds this file and treats the sectors it contains as the whole of it's own hard disc. Dos Plus contains code which then reads and writes sectors directly, so no further manipulation of high-level ADFS is required. The method of creating custom partition sizes involves working directly with sectors on the hard disc. You will need a disc sector editor which is capable of editing hard discs, such as ADT by Pres, or Pineapple's ADU.

Also, it is best to start with a totally blank hard disc. You should always keep backups on floppy of all your files, as hard discs are fairly unrecoverable if they crash. So the procedure is:

1. Format your hard disc for ADFS if it is not already formatted

2. Make backup copies of all files on the

hard disc

3. Delete all files from the hard disc

4. Startup the 512

5. Create a Dos partition of any size and make it bootable

6. Return to ADFS (BREAK, *CONFIGURE NOTUBE, CTRL-BREAK)

7. Delete the DOSBOOT file, so only directory Dos remains on the hard disc, containing a single file, DRIVE_C

8. *COMPACT the hard disc

9. Type *INFO $.DOS. This should produce:

```
DOS      DR (xx)    ØØØØØ7
```

10. Multiply the size of the partition you require in megabytes (must be an exact number of Mb) by 4096. For 18Mb, this is 18*4096=73728 which is &012000 in hex. Write down the six-digit hex number (with leading zeros) which is needed for step 12.

11.Using the sector editor, enter sector 7 (or whatever sector is reported by the INFO command above)

12. Write the size of the partition as a 24-bit word, low byte first to bytes &18-&1A of this sector. In this example, the value is &012000, so &00 is written to &18, &20 to &19, and &01 to &1A. Leave the sector editor, updating the disc.

13. Now type *INFO $.DOS.DRIVE_C. This should read

```
DRIVE_C    WR (Ø1)  ØØØØØØØØ
ØØØØØØØØ  ØØxxxxØØ  ØØØØØC
```

The last number (&0000C) is important.

14. Now multiply the size in megabytes by 1024. For 18Mb this would be 18*1024 = 18432, which is &4800. Write down the four-digit hex number.

15. Using the sector editor, enter sector &C (12 decimal) on track 0, or whatever sector was given at the end of the INFO listing at step 13.

16. Set the bytes &13 and &14 with the value from step 14. In this example, you would set byte &13 to &00, and byte &14 to &48. Leave the sector editor, updating the disc.

17. Now all that remains is to correct the free space map, which should only have one entry (ie, *MAP would show only one item) as you started with a blank or compacted disc.

The new start of the free space map will be the start of DRIVE_C plus its length in sectors plus 1. In our case: &0000C (the start sector, as learnt from step 13) + &12000 (the length, as learnt from step 10) + &00001. The new free space map starts at &1200D. The free space is stored at bytes 0,1 and 2 of sector 0, track 0 and this should be updated accordingly.

In this case : Set byte &00 to &0D, &01 to &20 and &02 to &01.

Note that the last bytes of sectors 0 and 1 on any ADFS contain a checksum of the other bytes. This must be correctly updated to avoid a 'Bad free space map' error. This can be avoided if you use a sector editor such as ADU from Pineapple which correctly recalculates the checksum before resaving the sector.

If your sector editor does not have a checksum recalculator, then you will be able to calculate it yourself using the following algorithm:

```
  cs=Ø
  carry=Ø
  FOR i=254 TO Ø STEP -1
  cs=cs + buffer?i + carry
  IF cs<256 carry=Ø ELSE cs=cs
AND 255:carry=1
  NEXT
  PRINT "Checksum is ";cs
(buffer?255=cs)
```

where 'buffer' is the start of the sector. To do this you will have to copy out the sector to a separate 256-byte file, preferably on a floppy. Get the sector from disc to a known memory location, make the alterations, run the above as a Basic program, setting

'buffer' to the start memory location, calculate the new checksum, place it in byte 255 of the memory buffer and then save the block of memory back to the hard disc sector 0 or 1.

18. Now the length of the free space must be calculated. This is done by taking total number of sectors on the drive, which is stored in bytes &FC-&FE. In the case of a 20Mb drive, the values are &80, &32, &01, ie (&013280 sectors). So the remaining free space on the drive is &13820 minus &1200D (the space taken by DRIVE_C) which is &1273.

This number should be written to sector 1, (track 0), bytes 0,1 and 2, ie, &00 is &73, &01 is &12 and &02 is &00.

Again, when resaving this sector, the checksum must be recalculated to avoid a 'Bad free space map' error.

19. All that remains is to copy the file DOSBOOT back from the floppy into the ADFS root directory, and all should work. You now have a Dos partition, and can add any other ADFS files to the drive.

If you want to know about how ADFS stores file sizes and free space maps, it is all listed in Section J of the Master Reference Guide Pt.1.

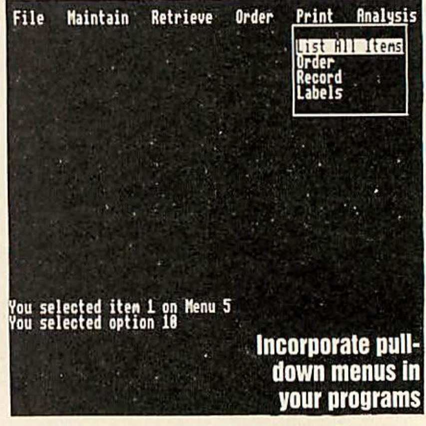
£10 UNIVERSAL MENU SYSTEM

Last year we published a menu system for BBC programs which emulated the *Lotus 1-2-3* program on PCs. Now Michael Isherwood from Bolton has produced one which lets you incorporate pull-down menus in your programs.

The program prints a list of menu options at the top of the screen and drops down the options on the first menu. Your left and right cursor keys step through the various menus and the up and down cursor keys highlight the items on each menu.

When you have selected your desired option, press RETURN. On this demonstration program, this will simply exit back to Basic but you will notice that the selected menu option is displayed, both in terms of the menu number and the option number in that menu, and as an absolute option number. This latter number calculated by FNoption gives a unique identifying number for every option on every menu.

To use the menu system with your own programs, you would insert the main code after the line UNTIL C%=5. To change the menu titles and options to suit your own tastes, alter the data lines at the end of the listing. The first data item is the number of menus. This is then followed by a line for each menu, starting with the number of



Incorporate pull-down menus in your programs

items on the menu, the menu heading text, and then text for each item on the menu.

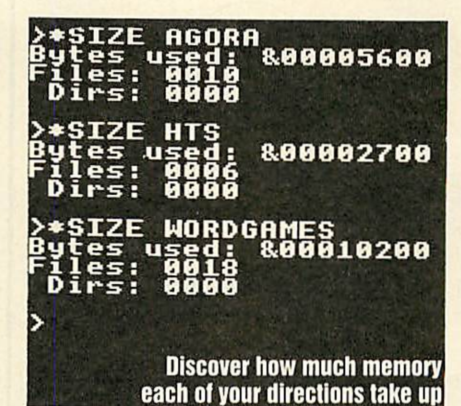
The program doesn't make any checks that the total number of menus or length of text will fit on the screen so you should check that this is correct for yourself. Also, the user defined characters 225 to 230 are set to draw the boxes round the menu items, so your own code should not redefine these.

£10 DIRECTORY SIZE CHECKER

Regular contributor Joe Abley of Bedford uses ADFS and Econet and has discovered it can be a lot of trouble finding out how much room a particular directory of files takes up on a floppy or winchester disc involving lots of *EXs, and some mental arithmetic. Of course, you could always use *FREE but this only tells you about the whole disc, not individual directories. What is needed is a sort of *FREE which will go down an ADFS tree and count up itself how much room is taken up.

Never one to let these shortcomings get the better of him, Joe has written a program which does just that. The program in the yellow pages generates a machine code file called SIZE which calculates the amount of space used by any directory, counting all its files, subdirectories and their files.

By typing *SIZE <dir>, the exact amount of space taken up by the contents of <dir> is displayed in bytes, along with the number of files and directories present. This program involves a recursive procedure which adds up the sizes of all files in a directory, calling itself for any subdirectories which may be present. Directories are taken to be &500 bytes long (as per ADFS). If no directory is specified in the *SIZE command, the current directory is sized.



Discover how much memory each of your directions take up

The program works by reading the argument to *SIZE using OSARGS with A=1 and Y=0. It then reads directory entries using OSGBPB (A=8), reads the lengths of items using OSFILE (A=5), and counts up directories and files as it goes in BCD. The nice part of the routine is the recursion, which elegantly allows the program to apply the counting routine to each subdirectory in turn no matter how deep.

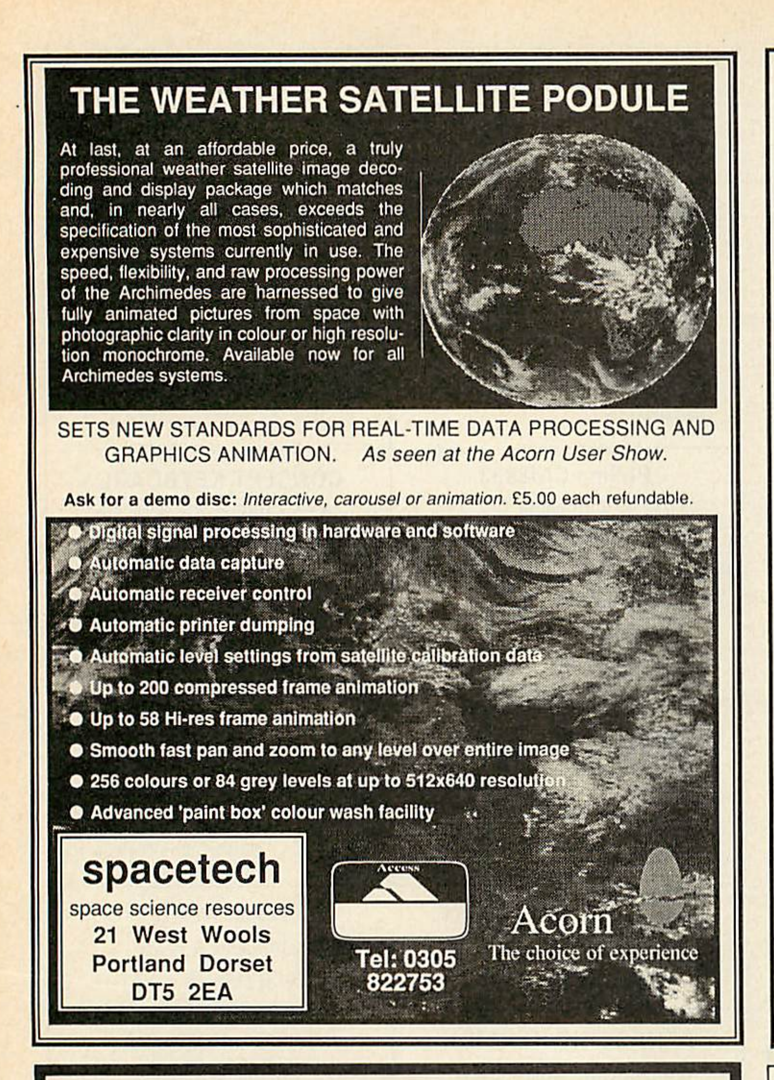
MATTERS ARISING

Iain King of Edinburgh has written to tell me that Derek Dingle's method (*BAU* Oct 89) of getting rid of the contents of the main text section in *Wordwise Plus* without getting rid of the segment contents is unnecessarily complicated, and suggests that simply typing :DELETE TEXT from the main menu is quite sufficient, and does reset the word counter.

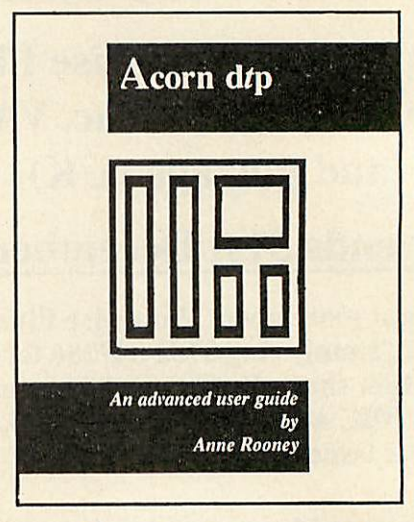
Thomas McIndoe of Glasgow has responded to Martin Brewer's Master 512 items reporting that in Dos Plus 1.2, different addresses must be patched to change the version number bytes.

I would have published these as a full tip but as I understand the upgrade to the latest Dos Plus 2.1 is now free of charge direct from Acorn, I assume everyone has or will be upgrading to the current version.

Eight Bits, like Hints and Tips, welcomes submissions. Of particular interest are items relating to applications programs – wordprocessors, spreadsheets, databases, art and DTP packages etc. Send submissions to Eight Bits, BBC Acorn User, *20-26 Brunswick Place, London N1 6DJ.*



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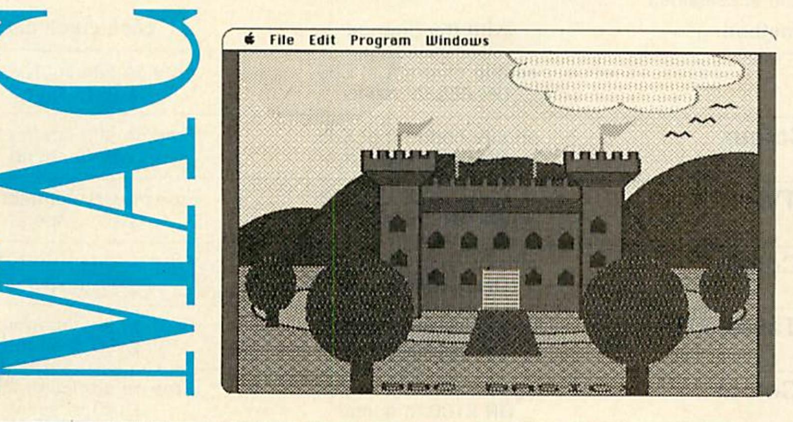
- **A comprehensive Help system** gives you instant information on keywords and operators, without interrupting what you are doing.

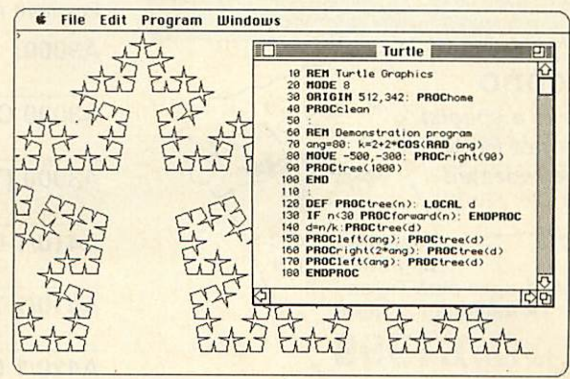
- **A Macintosh Toolbox interface** allows you to define your own menus, dialogue boxes, and scrolling lists using convenient BASIC keywords, and use the standard file dialogues for opening and saving data files.

The BBC BASIC package contains:

- One 800K disc containing BBC BASIC, File»Mac, and example programs
- BBC BASIC User Guide
- BEOS Reference Guide
- BBC BASIC Examples booklet







HUMAN COMPUTER INTERFACE · LIMITED

For more information: AU/1/90

Human-Computer Interface Limited
25 City Road, Cambridge, CB1 1DP, England.
Telephone: (0223) 314934 Fax: (0223) 462562

For fast delivery telephone your order on 01-205 9558 using VISA/Access Card

Orders welcome from government depts & educational establishments

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All prices ex VAT.
Prices are subject to change without notice.
Please add carriage
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(b) £3.50
(c) £2.00
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Special Xmas prices for Master Computer Systems

BBC Master Computer the most popular computer for education comes complete with a WordProcessor and Spreadsheet and fun/primary education packages.

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We can also offer systems to suit your specific requirements. Low cost finance available on above systems.

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ADJ23 Ref Manual II	**£14(d)**
TRC32 32K RAM Cart.	**£15(d)**
Master Dust Cover	**£4.75(b)**
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Ripper Stripper
A handy gadget to obtain clean tear-offs from fan fold paper **£4.50(d)**

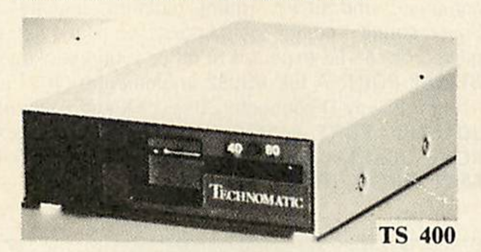
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A moulded plastic pocket to lock away your mouse when not in use **£4(d)**

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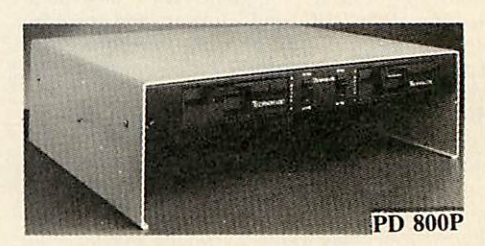
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An essential kit to ensure your mouse remains in perfect trim and provides precise operation **£4(d)**

TECHNOMATIC DISC DRIVES

A range of high quality high performance drives to meet the needs of all BBC Micro Users.
*All drives are fited with high quality slim line ultra lower power mechanisms capable of single and double density operation and offering fast track access and head setting times.
*5.25" floppy drives are fitted with 40/80 track switches as standard at no extra cost. The switches are located in the front and clearly marked to indicate the status at a glance.
*All drives fitted with all necessary leads and are ready for operation on unpacking. The drives with the mains power supply are supplied with a mains lead fitted with a suitably fused 13A moulded plug.
*Our plinth drives have been thoughtfully designed and provide a choice of two 5.25" drives or a combination of 5.25" and 3.5" drives.



TS 400


PD 800P

5.25" Single Drives 40/80 switchable:

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5.25" Dal Drives 40/80 switchable:

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PD800 800K/1280K with integral mains power supply	**£170(a)**
PD800P 800K/1280K with integral mains power supply and monitor stand	**£185(a)**
PD800 Case with psu & data cable	**£42(b)**
PD800P Case with psu & data cable	**£75(a)**

PS400/PS351 are Compact/Archimedes compatible.
PD800/PD352/PD853 are Archimedes compatible.

3.5" 80T DS Drives

TS351 single 400K/640K	**£69(b)**
PS351 3.5" single drive with integral mains power supply in a 5.25" case.	**£95(b)**
TD352 Dual 800K/1280K	**£126(a)**
PD352 3.5" dual drive with integral mains power supply in a 5.25" case.	**£139(a)**

Combo Drives (5.25" & 3.5" drives)

PD853	**£185(a)**
PD853 psu and plinth mounting	**£205(a)**

DISC DRIVE MULTIPLEXER
For Master, B, B + and any DFS/ADFS

TDM2 Two computers/one drive unit	**£65(b)**
TDM4 Four computers/one drive unit	**£115(b)**

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Most popular range of Winchesters for BBC. Drives are housed in metal casing fan cooled and powered by switch mode psu for quiet, efficient and reliable operation.
Front end utility for Master, format and verify program and Tree Plan directory structuring utilities are included as standard.

P30HD drive	**£399(a)**
P60HD drive	**£529(a)**
P304HD + 40/80T DS Floppy	**£529(a)**

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5.25" Discs in packs of 10

744 40T SSDD	**£5(d)**
745 40T DSDD	**£6.50(d)**
747 80T DSDD	**£9(d)**
3.5" DSDD Discs	**£9(d)**

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50 5.25" 40T single sided discs with sleeves in lockable box.	**£20(b)**
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40 3.5" 80T DS Discs in lockable box	**£38(b)**
Drive Head Cleaning Kits (5.25" or 3.5")	**£4(d)**

STORAGE BOXES

Library Cases:
10 × 5.25" **£11(d)** 10 × 3.5" **£1(d)**

Lockable Boxes;

3.5": 40 Discs	**£6(c)**	80 Discs	**£7(c)**
5.25": 50 Discs	**£6(c)**	70 Discs	**£7(c)**
		100 Discs	**£8(c)**

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BBC B/B+ Power Supply	**£65(b)**
BBC B Keyboard	**£52(b)**
BBC B Keyboard Connector	**£4.75(d)**
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Master Keyboard	**£62(b)**
Keyboard Connector set (M)	**£5(d)**
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CF30047 ULA	**£15(d)**
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ARC Power Supply	**£65(b)**
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Drive Cable	**£5(d)**
Keyboard Curly Cable	**£22(c)**
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41464	**£8(d)**

If the parts you need are not listed please call us

TIME WARP

Provides real time and date information. Time Warp with battery back up fitted as standard simply plugs into the User Port. Demo Software on Disc includes a diary/planner application. **£29(d)**

TEL: 01 205 9558

MINERVA's Archimedes Software

Sigmasheet	£57	System Delta+	£69
Deltabase	£24	Sales Ledger*	£53
Home Accounts*	£42	Purchase Ledger*	£53
Stock Manager*	£53		
Nominal Ledger*	£53	Reporter	£20
Ancestry	£59	Mailshot	£33
Gammaplot	£57		

System Delta + Reference Manual	£25
Order Processing/Invoicing*	£53
School Administrator	£66

** Requires System Delta*
(P&P on above items £2)

Archimedes to BBC SERIAL LINK

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.

Only £15

Archimedes 5.25"/3.5 Disc drive Interface

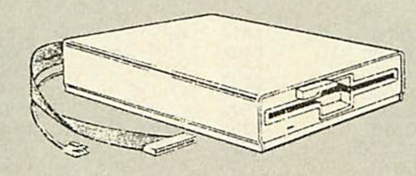
With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. NO SOLDERING is involved. Supplied complete with necessary lead.

Only £21

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheet, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below) **£439** ***(carr £7)***

XMAS FREE OFFER



A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables plus

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control. FREE with every BBC Master purchased from us during December

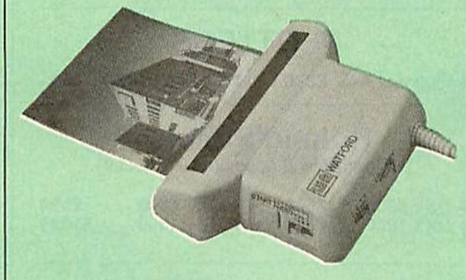
ADD-ONs & ACCESSORIES

Turbo 65C102 Add-on Module		£118
Econet Module for the Master		£49
Twin ROM Cartridge for Master		£8
Quad ROM Cartridge for Master		£12
Universal Processor Adaptor		£75
Master Reference Manual I	(No VAT)	£14
Master Reference Manual II	(No VAT)	£14
Master Advance Ref Manual	(No VAT)	£17
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Acorn 1772 DFS Kit complete		£49
ECONET Upgrade Kit for BBC B		£42
ALL ECONET UPGRADES Available		
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Morley Teletext Adaptor with ATS Rom		£99

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Filestore E60S	£1080	Ecolink	£270

(Carr. £2 to £7 depending on the weight)

Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system. The package includes the most comprehensive utility software available for the Archimedes, a high quality, ergonomically designed to fit the shape of your hand, (see drawing above) scanner, which is fitted with a warning LED that will indicate if the scanner is being moved too quickly for accurate results. Additional twin guide rollers ensure precise tracking over the image, to make the best use of the high resolution available with this sytem. The yellow/amber illumination of our Mk II scanner, enables you to achieve optimum accuracy. It is capable of scanning upto an amazing 400 DPI. The scanning area is 4" wide and the height is only limited by the maximu amount of memory available.

Launch offer £149
(P&P £4)
(Please write in for technical details)

Z88 Portable Micro



Watford Electronics are the largest Z88 Dealer in the UK

Only: **£195** (Carr £4)

FREE

With every Z88 purchased from us this month, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

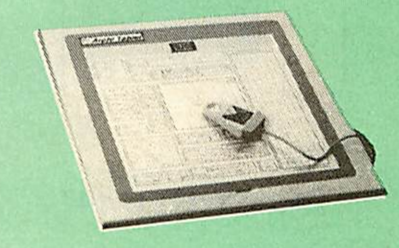
ACCESSORIES

32K RAM Pack or 32K EPROM Pack	£18.00
128K RAM Pack or 128K ROM Pack	£45
512K RAM Pack	£175
Z88 Eprom Eraser Unit	£35
Z88 Pipedream Spellcheck (Colton)	£52
Z88 Spellmaster for Pipedream	£51
Z88 Carrying Case	£9
Z88 Computing Book	£9.95
AA Nicad Rechargeable Battery	£1.50
Battery Charger Compact & Fast	£6
Z88 Serial Printer Cable	£9
Z88 Parallel Printer Cable	£25

● Z88 to BBC Link	£20	● Z BASE	£56
● Z88 to PC Link II	£30	● Z TAPE	£42
● Z88 to Macintosh	£52	● Z TERM	£42
● Z88 Mains Adaptor	£9	● Z88 Modem	£149

NEW

Archi Graphic Tablet



This package allows Archimedes users to take advantage of the low cost graphpad (sometimes called a digitiser tablet, but not to be confused with a video digitiser!)

The Archi Graphpad offers performance and accuracy comparable to other graphics tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely.

The software, which is in the form of a relocatable module (RM), intercepts the system calls which control the mouse, and so allows virtually all mouse based Archimedes software to be controlled using the tablet without any modification. The only exceptions are programs which use the serial port, as the tablet is physically connected to this port itself.

Graphics programs such as Artisan, Pro Artisan, AutoSketch, Oak DTP, and the RiscOS Draw, Paint and DTP packages are considerably enhanced by the use of the graphics table as opposed to the mouse, although it can, of course, be used with any other mouse driven application.

The software allows the user to define how much of the tabler's 12" x 12" working area to use, allowing very fine control when drawing freehand or tracing from a variety of differently sized drawings, diagrams, photographs, etc.

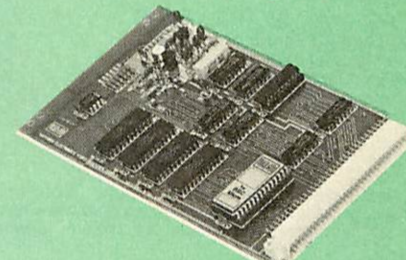
The tablet driver is compatible with all Archimedes machines, and with both Arthur and RiscOS operating systems.

The pointer is moved via a four button puck complete with transparent lens and crosshairs for optimum accuracy. Three of the buttons emulate the Archimedes mouse buttons precisely, the fourth being used for special functions such as setting the position and size of the active working area. The buttons may be remapped to allow the relationship between tablet and mouse buttons to be redefined, should this be required.

The software is supplied with a special adaptor lead to connect the tablet to the Archimedes' serial port, and a power lead which plugs onto the Archimedes' main board.

Launch Price £259
(Price includes Tablet, leads and software)
(P&P £4)

Archimedes Real-Time Digitiser



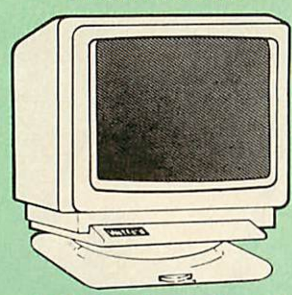
Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the *Archimedes range* of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £249

A Set of Colour Filters for colour image grabbing using a video camera **£16**

Continued→ → → → → → → → → →

MONITORS



MICROVITEC 14"

- **1431** – Standard resolution as used on the BBC television computer programme £175
- **1451** – Medium resolution, suitable for word processing in mode 0 £219
- **1455** – MS Medium resolution, ideal for Archimedes £220
- **1441** – High res, exceeds the capabilities of the BBC Micro £359
- **1431AP** RGB + PAL and AUDIO £199
- **1451AP** RGB + PAL and AUDIO £255
- **2030 CS** 20" Med Res £399
- **2040 CS** 20" Hi Res £675
- Dust Cover for Microvitecs £5.50
- **Touchtec 501 Touch Screen** £239

14" MULTISCAN COLOUR

- **TAXAN** Multisync 770 Plus £415
- **TAXAN** Multiscan 870 16" Monitor £575
- **TAXAN** Viking 19" Paper White, High Resolution (1152 x 896 with Archi 400 series) £799
- **EIZO** 8060H – For technical info. read the review in Micro User, Jan. '89 £429
- **EIZO** 9060S Super High resolution multiscan monitor for a wide range of applications. 800 dots x 600 lines. Display for high res VGA. 0.28 Dot pitch £469

TAXAN 12"

- Super Vision 3 – **Type 625** Super Hi-res RGB Colour, Green/Colour Switch £269

PHILIPS

- **BM7502** 12" Hi-res Green Monitor £64
- **BM7522** 12" Hi-res Amber Monitor £68
- **CM8833** 14" Med. Res Colour Monitor £195

STAR BUY

- **PHILIPS 14"** Medium Res, dark glass, attractively finished Colour Monitor – supplied complete with RGB, SKART and Audio/Phono Inputs. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

ONLY £189

Dust Cover for Philips Monitors £6
(Securicor carriage on Monitors £7)

SPARE LEADS

BNC Lead for Zenith or Philips £3
Skart Monitor Lead £5
RGB lead for TAXAN Monitors £3
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SWIVEL BASES

By simply placing your monitor on one of our front adjustable professional swivel bases (see drawing at the top), you can easily adjust the monitor viewing angle.

for 12" Monitors **£8** (carr. £2.50)
for 14" Monitors **£12** (carr. £2.50)

Anti Glare VDU Screen

These extremely effective, easy to install, 12" & 14" VDU screens eliminate harmful glare, improves contrast on colour monitors. Increases productivity in offices. A must for wordprocessor users.

Price £12

CONCEPT KEYBOARDS

Standard A3 Keyboard with BBC Software £143
Standard A4 Keyboard with BBC Software £117

PLOTTERS

- Plotmate A4S £379
- Plotmate A3M £549

Roland Plotters

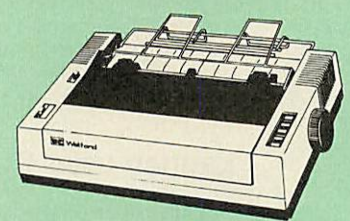
(Official Roland Appointed Distributor)

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- **DXY 1100** £630
- **DXY 1200** £879
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TAXAN KP-815 PRINTER
Offer Price £149

RS232 Interface £49
RS232 Interface with 2K Buffer £69
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Panasonic KX-P1081



SALE OFFER only: **£135**

(Price includes, FREE a 4ft Printer Lead, and a Dump Out 3, Screen Dump ROM worth £35 with every printer purchased from us)

KX-P1180 Printer Offer

Panasonic KX-P1180 printer, Dump Out 3, Screen Dump ROM & a BBC printer lead.

Offer Price £146

Panasonic Printers

- **KX-P1124** 24pin 80col. 192/63 CPS £245
- **KX-P1180** 9pin 80col. 144/38 CPS £146
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- **KX-P1592** 9pin 136col. 216/45 CPS £275
- **KX-P1595** 9pin 136col. 288/61 CPS £355

- **Panasonic KX-P4450** LASER PRINTER Latest technology at Watford's special offer price £1,349
- Spare Toner £29
- A4 Feeder £55
- Drum Unit £149
- Developer £115
- 1MB RAM Board £299

Panasonic Accessories
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KX-P1592/1595 (P32) £175 — KX-P1540 (P35) £185
KX-P1124 (P36) £88 — KX-P1180 (P37) £79

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P12 4K buffer Board for 1081 £55
P42 32K buffer Chip for 1592/1595 £25
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P17 P1081/1592 £32 — P19 P1124/1180 £55

Original Panasonic Ribbons

Guaranteed to last 3 million characters

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P115 for KX-P1180 £8
P145 for KX-P1124 £8
P140 for KX-P1540 £10
Colour Ribbons for KX-P1081, 1592 & 1595 Brown, Blue or Red £9.95 each

INTEGREX COLOUR JET

- Colour Jet 132 Printer £515
- Paper Roll £6.50
- Screen Dump Software £10
- Colour Cartridge £16.50
- Black Cartridge £10.35
- 100 A4 OHP transparencies £55
- 8K Serial Interface Optional £123

NEW – Intergrex COLOURCEL NPQ Ink Jet Colour Printer £2,695

NEC P2200 PINWRITER

24 pin; 80 column; 168CPS – 56CPS LQ; Epson LQ compatible, 7K Buffer; 7 resident FONTS, Friction & Tractor feed, front load single sheet feed, etc.

£245

XMAS OFFER:

We are giving away a Cut Sheet Feeder Unit FREE with every P2200 purchased during December.

Pinwriter Serial Interface (optional) £55
P2200 Cut Sheet Feeder £59
Additional Font Cartridge £25

NEC PINWRITER P6/P7 Plus

NEC P6+ 80 columns £439 — **NEC P7+** 136 columns £575
Colour Option £74 — Serial Interface £73
Cut Sheet Feeder £125
NEC Ribbons for P6 £8; P7 £9.50

Hewlett-Packard Lasejet 2

A low cost, high performance laser printer – 4 ppm, 512K RAM 4 fonts, 300 x 300 DPI, Serial & Parallel interfaces, 250 Sheets tray, etc. Ideal for DTP applications

Launch offer **£949**

Star Printers

Star LC10	£139	LC10 Colour	£195
Star LC24-10	£215	XB24-10 Colour	£425
NB24-10	£425	XB-10 Colour Kit	£24
LC10 Colour Ribbon	£5	Cut Sheet Feeder	£65

EPSON PRINTERS

EX800	£410	LQ550	£259
EX1000	£564	LQ860 Colour	£539
FX850	£310	LQ1050	£549
FX1050	£395	LQ1060	£679
FX1060	£679	LQ2550+	£895
LQ550	£259	LX400	£139
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LQ850	£405	SQ2500	£899

CUT SHEET FEEDERS for

EX800 **£149**; FX800/LQ800 **£149**; FX850/LQ850 **£149**; FX1000/LQ1000 **£179**; LQ500/LX800 **£79**; LQ1050 **£175**; LQ2550 **£390.**

TRACTOR FEED for

LQ800 **£44**; LQ850/FX850 **£69**; LQ1050/FX1050 **£85**; LQ2500 **£90**; LQ2550 **£90.**

ACCESSORIES

- EX800/1000 Colour Option £55
- EX800/1000 Colour Ribbon £18
- LQ2500 Colour Option £65

(Securicor Carriage on Printers £7)

EPSON PRINTER INTERFACES

All these interfaces fit inside the printer

RS232	£32	RS232 + 2K Buffer	£52
IEEE 488	£40	RS232 + 8K Buffer	£79

PRINTER LEADS

BBC Centronics 4' long £5
BBC Centronics 6' extra long £7
Compact's Special Centronics Lead £7
Archimedes Printer Lead 1 metre £6
Nimbus Centronics Lead £12
IBM Parallel Lead 1 metre £6
Double Ended 36 way Centronics Lead 4' £7
Double Ended 36 way Centronics Lead 6' £9
MSX Centronics Parallel Lead 4' £12
RS232 Leads (Various) P.O.A.

Listing Paper (Perforated)

- 1,000 Sheets 9.5" x 11" Fanfold Paper £7
- 2,000 Sheets 9.5" x 11" Fanfold Paper £11
- 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold £19
- 1,000 Sheets 15" x 11" Fanfold Paper £9
- 1,000 Sheets true A4 Fanfold Paper 70gms £11
- 2,000 Sheets true A4 Fanfold Paper 70gms £19
- Teleprinter Roll (Econo paper) £4

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

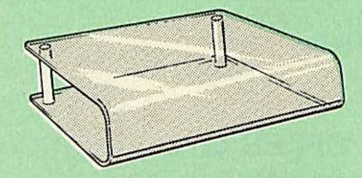
PRINTER LABELS

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	£5.00
1,000 90 x 36mm (Twin Row)	£4.90
1,000 90 x 49mm (Twin Row)	£7.50
1,000 102 x 36mm (Twin Row)	£6.25

Carriage on 1,000 Labels £1.00

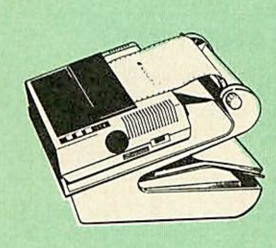
Perspex Printer Stand



Give you Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version £16 (carr £3)
136 Column version £20 (carr £4)

Professional Printer Stand



This new professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and refold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Additional facilities include: Easy access to paper from both sides, used with both top and bottom feed paper and with its dial controlled paper feed system with adjustable deflector plates it ensures smooth paper flow and automatic refolding.

80 Column version £23 (carr. £3)
132 Column version £26 (carr. £4)

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
Brother HR15/20	£3.00	–
BBC Micro	–	£3.50
BBC Master	–	£4.00
Archimedes Micro pair	–	£9.00
Citizen 120D	£3.95	£4.50
RX/FX80/MX80	£3.00	–
DMP2000	£3.75	£4.75
EX/LQ800	£4.50	£4.50
EX/LQ1000	£7.50	£5.00
RX/FX80/85/800/MX80	£3.90	–
RX/FX100/1000	£5.75	–
Kaga/Taxan KP810/815	£4.90	£5.00
LC10 (Black)	£4.25	£5.00
LQ500/800	£3.75	£5.00
LQ1050/LQ2500	£8.50	£5.50
LX80/86/800	£3.80	£4.50
M1009/GLP	£3.80	£3.75
NEC P2200	£6.00	£5.00
Panasonic KX1080/81	£4.00	£4.75
SQ2500	£23.00	£5.50
Star NL10	£3.75	£4.50
Olivetti Ink Jet Cartridges (set of 4)	£9	

Our attractive Dust Covers are manufactured from translucent PCV. The seams are stitched and edges are taped to prevent splitting due to continuous use.

Universal Printer Sharers/Changer

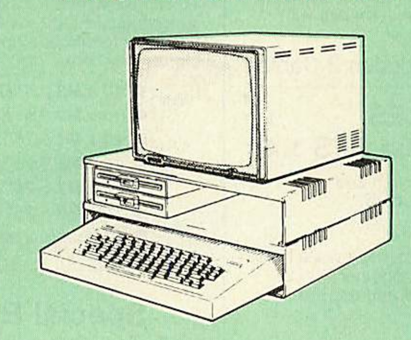
Connect upto 5 Micros to 1 printer or 5 Printers to 1 Micro with our combined, Sharer/Changer. These Units are made to a very high standard. For extreme reliability, they all have Printed Circuit Boards mounted inside the case, (not a Spaghetti Junction of wires). Internal connection is made via high quality ribbon cables.

(Ideal for School environments)

Connects	Serial	Centronics	P&P
2 to 1	£20	£22	£3
3 to 1	£27	£30	£3
5 to 1	£36	£39	£4

(Cables extra at £6 each. Please specify type required when ordering)

PLINTHS FOR BBC MICRO, MASTER & PRINTERS



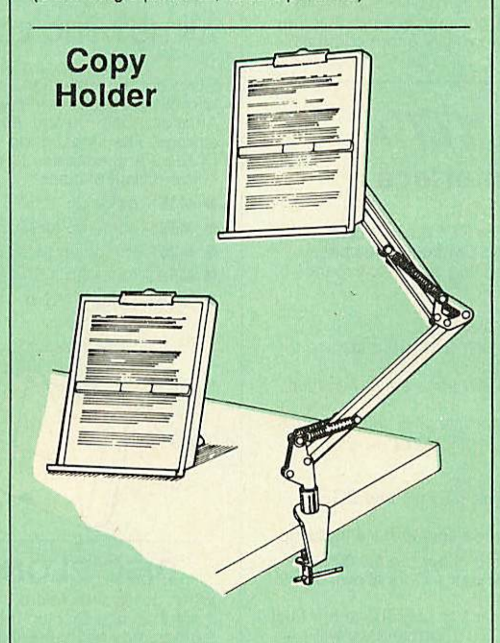
Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationary. The computer slides neatly in the lower section allowing easy access to remove the lid.

The single printer stand is equally sturdy but instead of cooling slots it has elegant cutouts on the sides. This allows easy access to paper from all sides. Colour: BBC Beige.

Single BBC Plinth	420 x 310 x 105mm	**£13**
Double BBC Plinth	420 x 310 x 210mm	**£24**
Printer Plinth	420 x 310 x 105mm	**£12**
Single Master Plinth	490 x 310 x 105mm	**£14**
Double Master Plinth	490 x 310 x 210mm	**£26**

(Carr. Single plinth £2; double plinth £3)

Copy Holder



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding you paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip. (for resting books or magazines, the desk top version is recommended).

Desk Top **£7** (carr. £3)
Angle poise **£12** (carr. £3)

Handy Printer Switch

A handy two way compact printer switch that enables you to connect 2 Micros to 1 printer, or 2 printers to 1 Micro. Attaches easily to your printer, monitor, etc. A low cost solution for educational establishments. Ideal for those wishing to use a dot matrix and a laser printer. Available in two configurations.

Compact AB Switch Centronics	**£20**
Compact AB Switch RS232	**£19**

(Cables extra at £6 each)

MEGABUFFER 256



The Smallest 256K Printer Buffer Unit in the world **38mm x 130mm x 134mm.**

This new Megabuffer 256 from Watford is a full featured 256K Printer Buffer. The features are:

- Improves efficiency by making more efficient use of computer and printer.
- Compatible with any computer and printer that uses Centronics Parallel connections including all BBCs, IBM PCs, etc.
- Total compatiblity with all software.
- Cheaper phone bills when using your Modems.
- Ideal for those doing large graphics screen dumps that are slow to print.
- Multi-Copy facility allows you to print several copies via Megabuffer without going through your computer.
- Data Dump facility is included.
- Built in text unit for both the buffer & your printer.

Only £149 (carr £5)

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms, see the feature in our advert.

THE EPSON RX-FX-KAGA
Printer Commands Revealed

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you are with all sorts of printouts to show its capabilites – he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

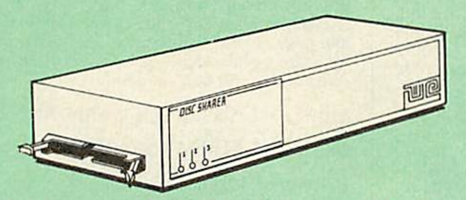
£5.95 (No VAT)



CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 50234 or 33383

Continued→ → → → → → → → → →

DISC DRIVE SHARER



(Ideal for educational establishments)

At last, a low cost alternative to the Econet system.Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disk, and red means that you are next in line. The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not for use with ADFS.)

Launch Price : **£65** Price includes 3 Cables

NOW WITH EXTRA FEATURES AT NO EXTRA COST – Watford's latest DFS 1.44

- Incorporates Acorn's Official Tube Host Code so that those with 2nd processors no longer need to waste a ROM socket on the DNFS.
- Option to DOUBLE the speed of BPUT and BGET.

If you already have the Watford Electronics DFS and wish to incorporate these new facilities then simply return your existing DFS ROM to us together with £5 remittance for an upgrade. Please pack the ROM securely and address the package to our Upgrades Dept.

WATFORD's & ACORN's DFSs

Watford's popular and widely acclaimed DFS has now been available for six years and has gained a large following amongst serious and educational users of the BBC Micro. Owners of Acorn or any other standard DFS can upgrade to our "Ultimate" DFS merely by replacing their DFS ROM. See below for this upgrade. ***(P.S. Watford's highly sophisticated DFS is fully compatible with Acorn standard DFS), (while Acorn's 1770 DFS is fully compatible with Watford's Mk II DDFS)***

- *Watford's sophisticated DFS ROM only* **£16**
- *We will exchange your existing DFS ROM for Watford's Ultimate DFS ROM for only* **£12**
- *DFS Manual (Comprehensive)* *(no VAT)* **£6.95**

(P.S. Our DFS manual is the only comprehensive Manual available for the BBC micro and covers both Acorn & Watford DFSs)

- *DNFS ROM only* **£17**
- *ADFS ROM only* ***£25***

(The single Density DFS system is now old technology. Like Acorn, Watford too have decided to replace it with the their more up-to-date 1770 DDFS interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).



Watford's MkII 1770
Double Density DFS Interface

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1770 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1770 DFS, plus the added features.

Added features include:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Tube host Code – No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk – Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII *version*, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only **£30.00.**

- SPECIAL PRICE **£44.00**
- DDFS Manual (No VAT) **£6.95**
- We will exchange your existing DFS Kit for our sophisticated DDFS for only **£25.00**

Please note, as the MkII DDFS is a hardware and sofware upgrade, it is not possible for existing Watford DDFS users to simply exchange the ROM for the new version.

DUST COVERS (For our Disc Drives)

Single CLS (without PSU) **£3.20** Twin CLD (without PSU) **£3.85**
Single CS (with PSU) **£3.25** Twin CD (with PSU) **£3.90**

3M – DISKETTES

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electonics your 3M Appointed Distributor

10 x 5.25" S/S D/D 40 Track Diskettes (744)	***£5***
10 x 5.25" D/S D/D 40 Track Diskettes (745)	***£6.50***
10 x 5.25" S/S D/D 80 Track Diskettes (746)	***£8***
10 x 5.25" D/S D/D 80 Track Diskettes (747)	***£9***
10 x 5.25" 1.6M D/S D/D High Density Discs for IBM XT and AT	***£14***
10 x 3.25" S/S D/D 40/80 Track Discs	***£10***
10 x 3.25" D/S D/D 40/80 Track Discs	***£10***
10 x 3.5" High Density Diskettes	***£25***

TOP QUALITY 3.5" & 5.25" DISKETTES

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

*10 x **M3** 3.5" D/S D/D 80 Track Discs*	***£9***
*10 x **M9** 3.5" Double Side High Density*	***£22***
*10 x **M4** 5.25" S/S D/D 40 Track Discs*	***£5***
*10 x **M5** 5.25" D/S D/D 40 Track Discs*	***£7***
*10 x **M7** 5.25" D/S D/D 80 Track Discs*	***£9***
*10 x **M8** 5.25" D/S H/D Hi-Density Discs*	***£14***
3" Double Sided Discs	***£2.50 each***

Special BULK OFFER on 5.25" DISCS

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)



BULK PACK DISCS in lots of 100

Type	S-S 40T	D-S 40T	D-S 80T
Without Sleeves	£30	£35	£40
With Sleeves	£33	£38	£43

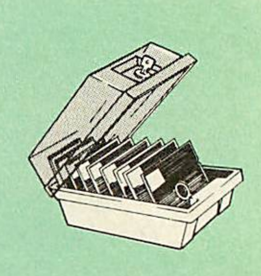
FLOPPY HEAD CLEANER KIT

The heads in floppy drives are precision made and very sensitive to dirt. The use of cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

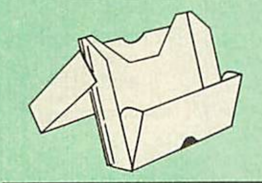
ANTISTATIC LOCKABLE DISC STORAGE UNITS

Gives double protection – Strong plastic case that affords real protection to your discs.
Antistatic helps avoid data corruption whilst in storage. The smoked top locks down.
Dividers and adhesive title strips are supplied for efficient filing of discs.



- **M35** – holds up to 50 5.25" discs **£4.95**
- **M85** – holds up to 95 5.25" discs **£6.95**
- **M25*** – holds up to 25 3.5" discs **£4.95**
- **M50** – holds 50 3.5" discs **£6.50**
- **M10** – holds 8 of No. 10 Data Cartridges **£15**

* Not lockable



PLASTIC LIBRARY CASES

Holds up to 10 5.25" Discs. Only £2.00

DISC PLONKER RACK

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the harzards of fingerprints, scratches, dust, coffee and an untidy desk.
Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.



Protection at Only: **£2**

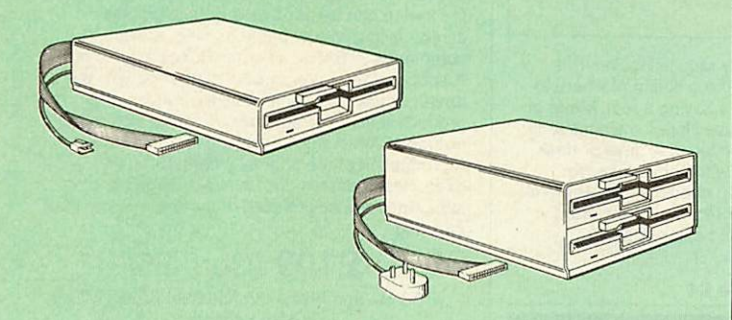
DISC ALBUMS

Attractively finished in black leather-look vinyl. Stores up to 20 discs. Each disc can be seen through the clear view pocket. £4

Quality Disc Drives from Watford

To help you decide which drive is the most suitable for your needs (and your pocket!), we have produced the table below.
This 30 Megabyte hard disc is completely compatible with the Acorn ADFS – that's why we have bundled it with each Winchester drive, along with an Utilities Disc.
The tinting on some of the boxes is used to indicate which Drives are 40 track (non-tinted) and which are 80 track (tinted). All our 80 track drives are already fitted with a 40-80 select switch.
***All our Disc Drives are Double Sided and will operate in both Single and Double Density modes.** Extensive experience of the usage of disc drives suggests that the JAPANESE drives currently represent about the best in terms of speed, reliability and overall "elegance" available for the BBC Micro.*
Various UK "manufacturers" of disc drives for the BBC micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high qulity NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public. If you look around the popular BBC micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, some of the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.
*Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. **Ideal for Schools & Colleges.** We are now able to supply all single disc drives with Power Supply, in either single or dual case. (Dual case has a twin data cable and a power supply capable of driving two disc drives) allows easy expansion to a dual drive unit, at a later date. Prices stated in the pricing boxes below are for single drives in standard single cases. Single drives in a dual case cost an extra £18. (At Watford we anticipate your needs of tomorrow, not just today!)*
When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space) your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 4th page of our advert for the Plinths).
P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is the special Compact Disc Drive Cables designed by us.

Our Disc Drives conform to BS415



"Test Bureau Approved for Use in Education"

Capacity	Drives without P.S.U.		Drives with P.S.U.	
	Single	Twin	Single	Twin
400K (720K)	CLS400S £75	CLD400 £168	CS 400S £85	CD400 £188
800K (1,44M		CLD 800S £153		CD 800S £163

● TWIN Disc Drive Case, complete with Power Supply & Cables £43
Securicor carriage on Disc Drives £6 to £7

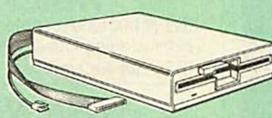
Prefix ***C** = Cased Drive*
***L** = Less PSU*
***S** = Single*
***D** = Double*

Suffix ***S** = 40-80 Switchable*

e.g. *CLS400S = Cased Disc Drive, Less power supply unit, single 5.25" 400K, (720K in double density); Double sided; 40/80 track switchable.*

Cable to connect 5.25" Disc Drives to BBC Compact
Single £9 Twin £12
Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Special 40/80 Disc Drive/DDFS Mk II Offer



- The popular 40/80 track 400K single Disc Drive, Double Sided, cased with Cables. Plugs directly to your Micro.
- Watford's extremely popular DDFS Disc Interface (allows 720K storage). Will run in both Single & Double Density modes.
- A comprehensive User Friendly Manual.

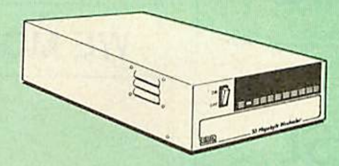
A Bargain at Only **£119** (£7 carr) (Offer valid while stocks last)



3.5" DISC DRIVE OFFER

These top quality 3.5" Double sided, 80 track, 1 Megabyte (unformatted each Disc Drives), are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Drives to connect to BBC Micros own PSU
● CLS35 400K Unit £69 ● CLD35 Twin 800K £125
Drives with built-in Power Supply Unit
● CS35 Single 400K £85 ● CD35 Twin 800K £135
(P.S. CS35 Single is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage).

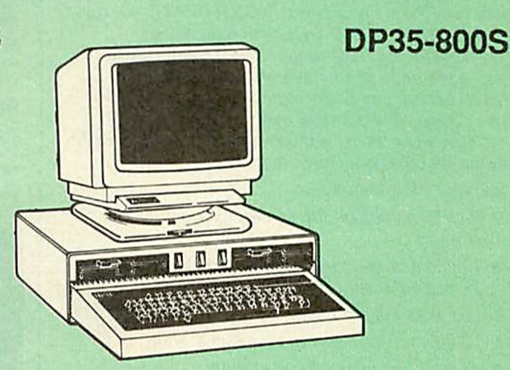


WATFORD's WINCHESTER DRIVES

Undoubtedly the best value for money Winchester Hard disc available anywhere for the BBC Micro.
This 30 Megabyte hard disc is completely compatible with the Acorn ADFS – that's why we have bundled it with each Winchester drive, along with a Utilities Disc.
Finished in rugged metal and fetching BBC beige, the Winchester has an internal fan, so quiet you won't even hear it! A switched mode power supply and a neon-lit on/off switch are there along with a light on the hard disc to tell you when it is working – just compare the price with our competitors' 20 or 28 Mbyte discs!
Compatible with the Master, and the BBC B (with 17 X disc interface).

● 30 Megabyte BBC Hard Disc **£369** (carr £9)

CDPM 800S DP35-800S



Twin 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour.plinth for the BBC Micro. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

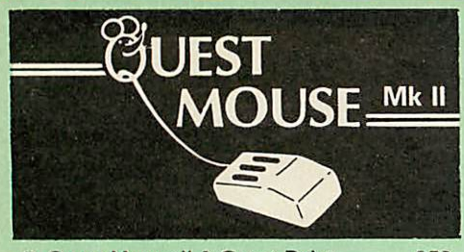
CDPM 800S for the BBC B & Master £179

A Double disc drive with a difference! Times are changing fast for the floppy disk, and whilst the current standard for the BBC B and Master series is the 5.25" disk, the standard of the future will most certainly be the smaller; faster and more reliable 3.5 inch disks – now a standard feature of both the Master Compact and the Archimedes Series.
To support the present disc drive users, and cope with the future, we have designed our own plinth-mounted disk system – called the DP35 800S. It contains both the 5.25 inch and the 3.5 inch drive formats as well as offer a firm and rigid support for a monitor on top. With the BBC Micro underneath, the plinth makes a surprisingly small footprint on the desk – leaving you more space to work with.
The 5.25" disc drive is 40/80 track switchable. DP35-800S has its own power supply, independent of the BBC Micro.

DP35-800S for BBC/Master £165

(Securicor Carr. £7)
(The above drive units are 2 Megabytes unformatted)

Continued→ → → → → → → → →



- Quest Mouse II & Quest Paint £58
- Quest Mouse II, Quest Paint, AMX Stop Press & Pagefont £89
- Quest Mouse II only £29
- Quest Paint Software only £34
- Quest Font Disc £15
- Quest Mouse Mat (Red or Blue or Green please specify) £3
- Part Exchange your unreliable AMX Mouse for a Quest Mouse for only £22
- GXR ROM for the BBC Micro £22
  (P.S. Quest Paint is not compatible with BBC Compact)

N.B.
1. Quest Paint supplied complete with Software in a 32K ROM, Comprehensive User Guide and a Utility Disc.
2. Quest Font Disc has 22 text FONTS for use within Quest Mouse.



Watford's Quest package is an extremely powerful and flexible drawing package, with very wide and unusual features. However, since its launch various suggestions for even more advanced and powerful facilities were received from the Quest users. ConQuest allows you these more advanced facilities, like, distortion of a cutout to any shape and a full font designer. If you also have a GXR ROM in your machine or you are using a BBC Master then ConQuest will take advantage of this to give ellipses at any angle, sectors and arcs, etc. Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

Some of the features are:

- *Pick filenames off the screen for loading and saving.*
- *Rotate a cutout to any angle and Distort it to any four sided shape.*
- *Has Built in Font editor.*
- *Default brushes and patterns on startup.*
- *16 x 16 font available on start up.*
- *Ability to reset patterns, fonts and brushes to default at any time.*
- *ROM based enhanced Epson and compatible printer dump.*
- *ROM based enhanced extended picture routine.*
- *Ability to create and abort extended pictures.*
- *Improved disk access speed for extended pictures.*
- *User definable sideways RAM driver for incompatible sideways RAM systems.*
- *Ellipses at any angle on Master 128 (or B with GXR ROM).*

ConQuest ROM Package £30
(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)



ARCHI Mk II MOUSE

An extremely reliable replacement mouse for Archimedes Micro £39

RB2 Marconi TRACKER BALL

RB2 (AMX/Quest compatible)	£45
RB2 including Quest Paint	£75
RB2-A for Archimedes	£52

THE NEW Mk III AMX MOUSE

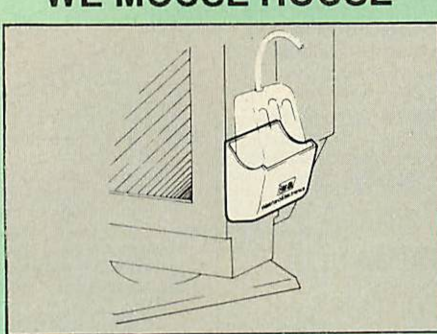
Inc. Super Art package

ONLY: £59 (carr £3)

(Please specify for BBC, Master or Compact)

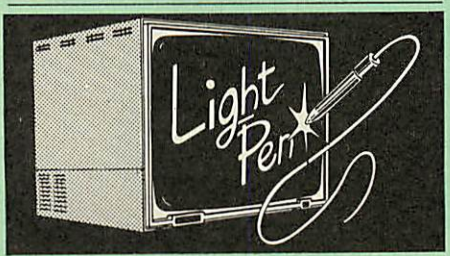
MOUSE MAT	£3
AMX MOUSE ONLY	£29
AMX SUPERART Package	£34
AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse	£32
PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker	£13
AMX DESIGN (ROM)	£55
AMX XAM Educational	£15
AMX EXTRA EXTRA	£16
AMX MAX A gem of desktop (ROM)	£20

WE MOUSE HOUSE



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive or desk. It protects it from damage when not in use, yet within easy reach when you need it again. There is also a second compartment for your pens and pencils – and at £4 it doesn't cost a rodent's ransom.

Price £4



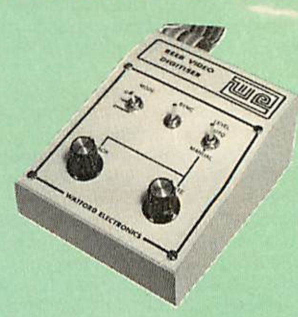
Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted. (Price includes FREE software Disc and Operating Manual)

Only £21

FLEET STREET EDITOR

Software pack for BBC Micro	£33
Software pack for the Master	£39
Admin Xtra Disc Utility	£13
Walt Disney Disc Utility	£13
Fonts N Graphics Disc Utility	£13

BEEB VIDEO DIGITISER



"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro.
This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket.
Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.
Both the black and white levels can be adjusted manually for the optimum picture, or switched to automatic for unattended use. The image produced can be reversed if necessary.
Full controlling software is supplied on a normal sideways ROM and this is easily accessed via additional ★ commands. The package is designed to allow easy input of complex screens and give full access of the data to the user. Once on the screen, the image can be used as a normal graphics screen, allowing any of the usual graphics commands in BASIC or other ROMs to work on it.
A special print dump routine is included with the driver programs. This is specially designed to produce a fast, correctly proportioned picture, with reduced "contouring", resulting in an accurate reproduction of the original image. Detailed examples of driving this unit from BASIC or other languages are all provided in the extensive manual supplied.

£109 (Carr. £5)

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

Magazine Maker

(As seen on TV)

A combination of Stop Press and Watford's Beeb Video Digitiser.

Using any video that provides a composite signal and the digitiser, images from a camera or TV can be converted into a graphics screen on the BBC Micro.

They can then be used within Stop Press to illustrate magazines or newsletters – in fact anything that needs to be created on A4 size paper.

With Stop Press's many features, a variety of pictures can be composed – the only limit being the imagination.

Pictures can be doctored using Stop Press's graphics option to produce any number of effects.

Text can be formatted around the digitised photo on screen using the facilities available, which include 16 typefaces, character and pattern definer, text formatting and the ability to load in Wordwise and View files plus much more.

Once created the picture can be printed out.

The Magazine Maker is suitable for any use that requires illustrated documents.

Complete Package **£135.00** (carr. £3)



The WAPPING EDITOR

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

PAGE LAYOUT SECTION

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module is a mode 0 version of the highly acclaimed Quest Paint package, detailed elsewhere in our advert, and incorporates all the same drawing facilities, e.g. pencil, brush, airbrush, polygon, circle, ellipse, fill, cut-and-paste, etc., etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

WORD-PROCESSOR

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

THE FONT EDITOR

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individually proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.

Upgrading to the Wapping Editor could not be easier since the font editor will convert fonts from other packages, such as Quest Paint or Stop Press (formerly Pagemaker), into Wapping Editor format and a mode conversion utility will convert any screen in modes 1, 2, 4 or 5 into a full grey-scale mode 0 screen. Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser, either independantly or from within the Wapping Editor package.

For convenience all types of file may be stored on the same disc, with the software intelligently and transparently distinguishing between them. Filenames are picked off the screen with the mouse, dispensing with keyboard entry wherever possible.

"The Wapping Editor combines sophistication with ease of use and power with simplicity, to make it the most comprehensive and user-friendly DTP system ever likely to be written for the Beeb".

Wapping Editor Software Pack	£69
Wapping Editor plus Mouse	£89

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc.
Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages layed out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

The Beeb HandScan
Hand-held Scanner for the BBC Micro



Watford Electronics are pleased to announce the launch of the first hand held scanner for the BBC Micro. HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs! These useful devices have been available for faster and more expensive micros for some time, but only now is Watford Electronics able to offer the BBC Micro computer.

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

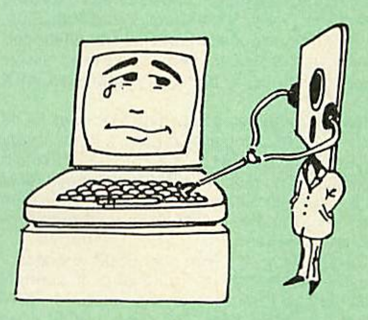
Beeb HandScan & Firmware	£135

Wapping Font Disc

Sixteen Wapping Editor fonts including smaller versions of Oberon and Daisy and two new sizes of the standard font.
Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions.

£12

DIAGNOSTICS DISC



The BBC Micro is a very complex machine and thus diagnosing a fault can be very difficult. At Watford Electronics, we realise how difficult it can be when faced with a problem, finding yourself a long way from your nearest dealer, or even just uncertain about your Beeb's health, but not wanting to waste time and money taking it to be looked at.

The solution to these problems is here now, in the form of the Watford's Diagnostics Disc. This excellent utility is specially designed to test out the following areas of your Beeb:

RAMs, ROMs, ULAs, Sound, Keyboard, Disc, RS423, ADC, User Port, Printer Port, Cassette, Joysticks, Speech, Disc Drives, 6502 and Z80 2nd Processors.

This utility is an invaluable aid for all those who take the reliability of their system seriously. A comprehensive manual provides full operating details and a list of possible causes and remedies for any faults that you may find along the way. The package also enables a permanent equipment and service record to be maintained.

Only £20.00

(Only suitable for BBC B with 8271 DFS)

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms see the feature in our advert.

NEW

Beeb DOS 2.2

The BBC and IBM PC's are the most popular micros in the UK. The BBC is firmly established in the education sector and the IBM is the industry standard in the business world. The pools of information and applications held on these computers are immense, yet the means of passing information between them are very limited. Beeb DOS provides a practical method of transferring information between these two micros.

Beeb DOS is a collection of utilities which run on the PC's and enable it to read and write information on BBC discs. You can transfer files between your PC's 360K floppy, high density floppy or hard disc and your BBC discs. In addition Beeb DOS allows you to catalogue, format and compact BBC discs and delete, re-name, lock and unlock BBC files, all on PC's. Each Beeb DOS utility is written in IBM assembler and is run directly from PC or MS-DOS. The Beeb DOS utility can be run from floppy disc, hard disc or RAM drive.

Beeb DOS is supplied on an IBM 5.25", 360K disc complete with a comprehensive operating manual.

Price: £39

(Please write in for technical literature)

Continued→ → → → → → → → → →



ARIES CORNER

B-32 Shadow RAM Card

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Cobal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved *FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as th printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the 6502 processor socket on you BBC micro – no flying leads to connect and no soldering. Provision of the onboard ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

● Recommended by Computer Concepts for use with their Inter series of ROMs.

Price: **£69** (carr. £2)

Aries B-12 Sideways ROM Board

The B-12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal cost

Price:	Aries B-12	£36
	Aries B-12C	£5

ARIES B-488 IEEE-488 INTERFACE UNIT

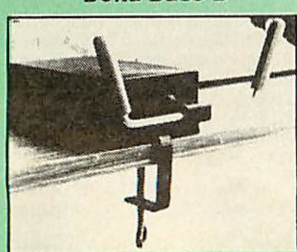
The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB' or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238 (Carr £3)

VOLTMACE JOYSTICKS

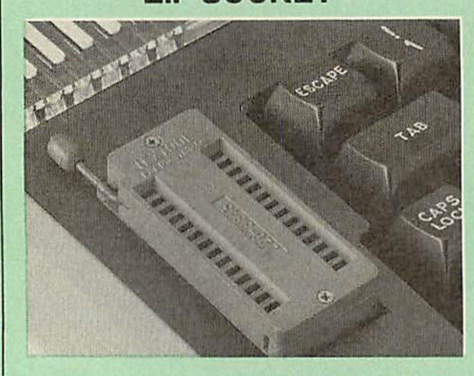
Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
Delta 3C Joystick for Compact	£10
Delta 14B Single Joystick	£11
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7
Delta-Cat A mouse eliminator Joystick for the Archimedes	£24

Delta Base B



Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128 — £25

SIDEWAYS ZIF SOCKET



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

● Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.

● The low profile of the socket allows unrestricted access to the Keyboard.

● All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.

● This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for professionals and Hobbyists alike.)

● BBC, B+ and Master compatible.

ONLY **£18** (carr £3)

Low Profile CARTRIDGE SYSTEM

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack for the BBC B.

● Complete System	£11
● Spare Cartridges	£2.50
● Spare Rack	£1.50

ROM Cartridges for the BBC Master

Will accept the new larger Piggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin **£8** Quad **£12**

16K DISC RAM

(16K Sideways RAM Module)

Complete with such features as read and write protection, these new modules from Watford Electronics are ideal for the hobbyist, software developer and ROM collector.

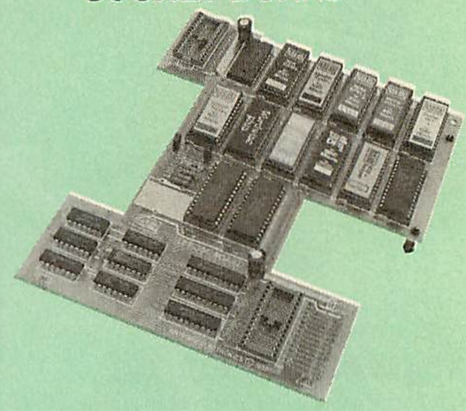
Key points to note about this new addition to the Watford range of products are:

- Write protection (useful in a variety of circumstances)
- Compact construction
- Supplied complete with Battery Backup.
- No overheating or overloading problems.
- Free utilities disc supplied
- Can be used as a 16K PRINTER BUFFER.
- Ideal for professional software development.
- Supplied with utilities software disc.

Only: **£32** (carr £2)

P.S. 16K Disc Ram Board is not designed to work in conjunction with a Sideways ROM Board.

SOLDERLESS SIDEWAYS ROM SOCKET BOARD



In the May 1986 Micro User's independent review, the writer concludes, "The board has been well laid out. Its position is much better than others – not over the HOT RAM chips and further away from the disc controller area". "I give the solderless ROM board the thumbs up and wish it success".

This brand new board from Watford Electronics is designed specifically for those wishing to add a ROM board to their own BBC without the need to perform any soldering.

This new board expands the total possible number of ROMs in a BBC from 4 to 16.

Unlike our competitors inferior boards, the ONLY upgrade required for fitting battery backup to the Watford Solderless ROM board (all Watford ROM boards, actually) is the fitting of the battery itself. (No other expensive components are required.)

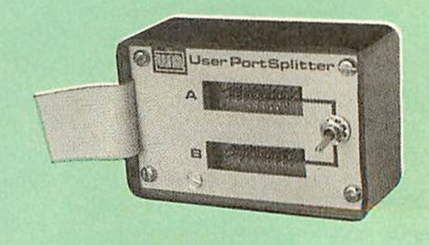
- The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:
- increase your BBCs capacity for ROMs from 4 to 16.
- **No soldering required.**
- Very low power consumption.
- Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £35
Battery Backup fitted **£39**
Battery Backup only **£3**
16K Sideways RAM **£9**
(carriage £2)

● Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

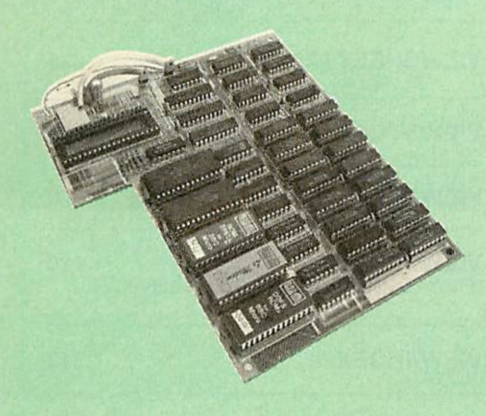
USER PORT SPLITTER UNIT



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

Excellent Value at **£22** (carr £2)

ROM/RAM CARD



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 6 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO overheating problems.
- NO User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Firm mounting in BBC micro.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- Accepts any ROM.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

Please write in for further details.

INTRODUCTORY PRICES:

- ROM/RAM card with 32k dynamic RAM £48
- ROM/RAM card with 64k dynamic RAM £65
- ROM/RAM card with a massive 128k dynamic RAM £109

(carriage on ROM-RAM Card £3)

OPTIONAL EXTRAS:

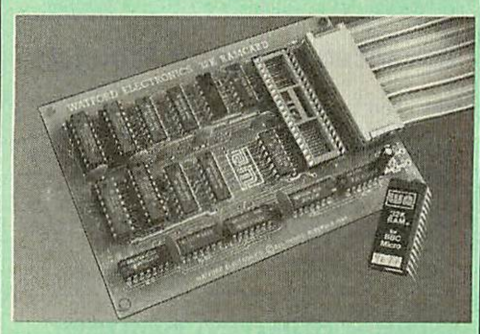
- 16k plug-in Static RAM kit £9
- 16k Dynamic RAM for Upgrade £13
- Battery backup £3
- Read and Write protect switches ....£2 each

Complete ROM-RAM board All options installed £115

P.S.

IS your existing ROM Board overflowing with ROMs? Do you need more Sideways RAM? Is your Board unreliable? Then upgrade to Watford, ROM/RAM Board and pay £5 less.

32K SHADOW RAM-Printer Buffer Expansion Board



A MUST FOR WORD PROCESSING

Watford Electronics now brings you the latest state-of-the-art MEMORY EXPANSION BOARD for your BBC microcomputer. Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16k or even 20k, but a massive 32k of extra RAM!!!

- IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer – type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free – 5 times as much as normal.

- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.

- Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.

- Use the FULL 32k or the bottom 12k of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS432 etc. Print large text files while running long graphics programs, and have all your buffer options available as well (*FX15,21,138, 145,ADVAL etc). Please note only a 12k printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.

- Unique facility to turn ROMs off and on again. Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

Only £59 (carr £2)
(Price includes a comprehensive manual and the ROM)

INCREDIBLE WORDPROCESSING DEAL

Watford's 32k SHADOW RAM CARD and Computer Concept's INTERWORD Wordprocessor package.

at Only **£89** (Carr £2)

CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 50234 or 33383

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms. See the feature in our advert.

BBC SOFTWARE'S Popular Educational Software

- Maths with a Story 1 (Disc). 4 primary level maths programs £11.25
- Maths with a Story 2 (Disc). 4 further maths programs. £11.25
- Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design & colouring programs. £17.00
- RELATIONSHIP: Science (Disc) O-Level Biology program. £20.00
- BONDING: Science (Disc) O-Level Chemistry program. £20.00
- ELECTROMAGNETIC SPECTRUM (8 Discs) O-Level program. £20.00
- ELECTRONICS IN ACTION (Disc) O-Level program. £19.95
- NEWTON & THE SPACE SHUTTLE (Disc) O-Level program. £20.00
- ECOLOGY (Disc) O-Level program. £20.00
- POLYMERS (Disc) O-Level program. £20.00
- Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule. £20.00
- FOOD & POPULATION (Disc) O-Level program. £20.00
- MICROTECHNOLOGY (Cassette) O-Level program. £11.25
- A VOUS LA FRANCE (2 Cassettes) A French language home study aid. £21.70
- DEUTSCH DIREKT! (Disc & Audio Cassette) £19.95
- Modem Master (Disc) £11.25
- ADVANCED TELETEXT SYSTEM £8.65
- PERIOD TABLE SOFTWARE £20.00
- Astronomy – Primary (Disc) £12.00
- Computers at Work – Primary £17.35
- Introducing Geography – Primary £17.00
- Introducing Geography 11-17 years £17.50
- Electric Fields 6-14 years £11.25
- Black Queen Contract Bridge £13.00
- Espana Viva – 3 Discs £19.95
- A Vous La France Disc £21.50

Educational Software

FUN SCHOOL 2 – Red:
Under 6 yrs – 8 programs on Discs, Shape Snap, Find the Mole, Teddy Count, Write a letter, Colour Train, Pick a Letter, Spell a Word & Teddy Bears Picnic.

FUN SCHOOL 2 – Green:
6-8 yrs – Eight programs on Disc, Number Train, Shopping, Maths Maze, Treasure Hunt, Bounce, Packing Caterpillar, 3 Number jump £11.00

FUN SCHOOL 2 – Blue:
Over 8 yrs – Eight programs on Disc, Build a Bridge, Passage of Guardians, Unicorn, Logic Doors, Souvenirs, Code Boxes, Mystery Machine & Escape. £11.25

Versatile BEEB SPEECH SYNTHESISER Unit



The Watford Speech Synthesiser is a very flexible speech synthesis unit based upon the powerful phonemes system. This system stores the building blocks of speech (called phonemes) and allows you to combine them quickly and easily to form virtually any word imaginable.

Supplied with an advanced ROM, you are provided with a 500 word dictionary to get you started. These can easily be added to by following the notes given in the comprehensive manual.

SPECIAL PRICE £32 (carr £2)

Continued→ → → → → → → → → →

COMPUTER CONCEPT'S ROMS

ACCELERATOR	£30
CARETAKER Basic Utility	£23
DISC DOCTOR	£28
Graphics ROM	£29
TERMI	£25
COMMUNICATOR	£49

Wordwise £26

Wordwise plus £40

We are giving away absolutely **FREE**, the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid

The most comprehensive utilities ROM for Wordwise-Plus

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of WORDWISE PLUS.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear test-segment area.
- BBC B, B+ and Master compatible.

Only **£24**

(N.B. Word Aid requires a Disc interface in your Micro)

HI-WORDWISE-PLUS DISC: £5

SPELL MASTER £42

Inter SHEET ONLY £37



ONLY: £25

Inter-WORD £36

MEGA-3 ROM

Interword, Intersheet & Interchart – 3 in one ROM £76

INTERBASE £49

All Prices Exclusive of VAT

MINI OFFICE II

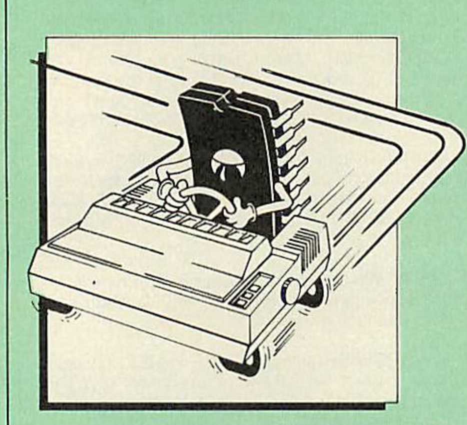
DISC Version for BBC B & B+	£14.00
DISC Version for BBC Master	£16.50
DISC Version for the Compact	£18.00

(When ordering please specify for which Micro & 40 or 80 track Disc)

Advanced Computer Products

Advanced Disc Toolkit	£30
Advanced Disc Investigator	£25
Advanced 1770 DFS BBC	£29
Advanced 1770 DFS Master	£30
Advanced File Manager	£25
Advanced Control Panel	£30

VIEW PRINTER DRIVER ROM



View is a powerful word processor, but until now has seriously lacked in terms of printer support. With the launch of our Printer Driver ROM, which includes an extremely powerful and easy to use Printer Driver Generator, View users can find themselves in the realms of advanced word processing at only a small outlay.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, LX, JX80 range, HI80, KP810/910, PW1080, JP101, HR15, M1009, GLP, Panasonic KX-P1081/2, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built-in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript, Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redifinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute ★ command when printing.

Other features include a very powerful on-screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory-based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips. (Write in for a detailed leaflet).

Price: Only £33

VIEW 3.0 ROM	**£48**
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VIEWSTORE	**£36**
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SPREADSHEET – Offers many calculation and editing features

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The Advanced Reference Manual for the BBC Master

At last Acorn's long awaited Advance Reference Manual for the BBC Master Series of Microcomputers has now been published. Watford Electronics' own authors have edited and added missing sections to the original script and produced a very high quality publication.

It features information about:

- Memory Organisation
- Slow data bus
- Detailed circuit description
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- Screen display
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- 1 Mhz Bus
- Machine operating system
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- Disc Filing Systems
- ANFS
- Terminal Emulator & Editor
- View internal format
- Detailed differences between Model B, B+, Master 128K and Compact
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At the rear of the manual there are pull out circuit diagrams for the Master 128K.
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NEW

The Complete Mouse User Guide to BBC Micro

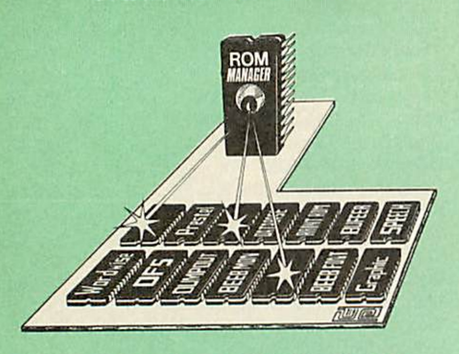
This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included. These may be typed directly into the micro, without the need for any understanding of the hardware or software involved, enabling the mouse to be used for custom applications.

Price £5.95 (No VAT)
Example programs on Disc £4.95

Continued→ → → → → → → → →

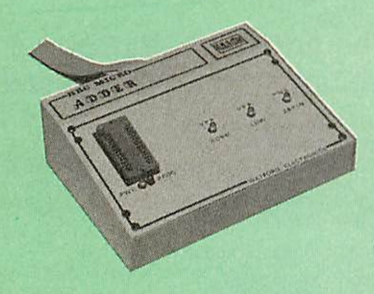
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Take control of your Sideways ROMs with ROM Manager. This powerful utility ROM gives you power over your sideways ROMs . Disable whole ROMs, send commands directly to named ROMs and many other powerful facilities.
"Provides comprehensive management of all your installed ROMs". (BEEBUG November '84.)

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Adder is the ultimate EPROM programmer for the BBC Micro. It will program many different EPROMs up to the very latest 27256 32K devices.
The Adder unit connects to the User Port and draws its power from there too. The EPROM is mounted in a top quality ZIF socket. There are no switches or controls as Adder is entirely software controlled.
The Adder software provides sophisticated facilities for programming EPROMs from a RAM image produced by loading disc files. The software is menu driven and designed for ease of use.
Features:

- Two ultra fast programming algorithms or standard slow algorithm.
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- The RAM image to be programmed can be built up in many ways. Sections of image can be loaded separately. Part programming. Read EPROM. Edit data in memory.
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- Works with all standard filing systems. Generates header code for RFS ROMs to allow Basic programs etc. to be stored in EPROM. More than one file per ROM permitted.
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£65 (£5 Carr)

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The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast. We use these erasers for all our own erasing work.

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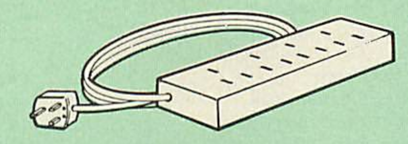
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28pin DIL HEADER PLUG

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The Aries IBM PC-XT 88 and Aries PC AT286 compatibles are now supplied with Digital Research's GEM, Microsoft MS DOS 3.30, GW-BASIC 3.21, the powerful Finesse 1.1 Desk Top Publishing package, Multiwriter WORDPROCESSOR & Spell-checker, PC Organiser and 12 months on site maintenance warranty. So you not only get the best all round value in PC compatibles, (£300+ worth of FREE Software & Hardware with every system), but you also get a complete and powerful WYSIWYG DTP software package that takes you from typewritten text onto typeset quality layouts. LOGITECH MOUSE too is included with the package. WATFORD GIVES YOU MORE FOR YOUR MONEY. (P.S. To operate Finesse DTP, you require a Hard Disc System).

ARIES PC-XT 88



ARIES PC AT 286



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- 640K RAM standard expandable on-board to 4MB.
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- CLOCK on System board, gives non stop DATE & TIME.
- 8 expansion slots.
- 102 key keyboard
- Serial/Parallel Card.
- HDD/FDD Card
- Switchable Speed 8/12M Landmark test at 16MHz
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- Slide in metal case with function display.
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● FREE 12 month On-site Maintenance warranty (UK mainland) included in the price

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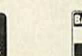


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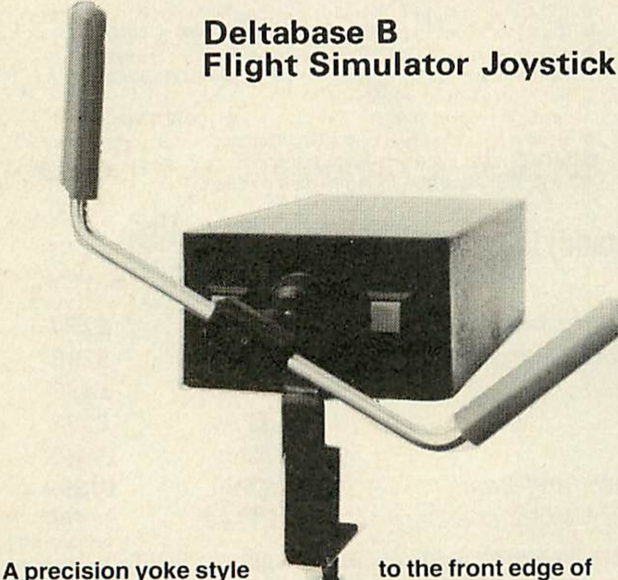
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Ziggy (Solution + maps)
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Airwolf (Solution + map)
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WHITE MAGIC 2
(The Fourth Dimension)

Following the success of the superb White Magic, The Fourth Dimension have now released an easy to use level designer plus 32 new challenging levels. The designer allows you to create infinite numbers of screens and the new levels are harder than the originals for those who are ready for a real challenge.

Prices Below.

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(The Fourth Dimension)

3D CAR RACING FOR THE ARCHIMEDES

E - Type has been programmed by the author of Holed Out. It's an incredibly thrilling game allowing you to race a gleaming £70,000 E-Type at speeds over 150mph. Drive through hills, lanes and valleys with varying backdrops. The digitised graphics and sound effects are unbelievable - it's an absolute must.

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Fugitives Quest (Robico)	25.95
Rise in Crime (Robico)	25.95

* = Due for release 6th December, 1989
All the above games will work on Archimedes A3000, 310 an 400 series.

HOLED OUT EXTRA COURSES

Due to overwhelming public demand The 4th Dimension has now produced 2 volumes of extra courses for their superb 3D golf game Holed Out. Each volume contains 2 superbly designed brand new courses plus the original Holed Out program; therefore you do not need the original Holed Out in order to play them.

"I play golf and this game is the closest thing I've seen to the real game on a computer". *Archive, June 1989*
"I wouldn't have thought it possible to get a better simulation out of the beeb." *BBC Acorn User, June 1989.*
"The 3D perspective graphics are stunning" *Electron User GOLDEN GAME June '89*
"Holed Out is great.....The game plays very well and the graphics are superb."
Popular Computing Weekly, March 1989
"The best golf simulation I've ever seen on any Acorn machine." *The Micro User, June 1989*
"The Electron version is brilliant - it's almost the same as playing at Gleneagles. Unreservedly recommended."
A & B Computing Game of the Month, June 1989

Prices above and opposite

ARCADE SOCCER
(The Fourth Dimension)

A brilliant soccer game of the quality that only The Fourth Dimension could produce. Superb graphics, League System, throw-ins, corners, diving goalies, superfast action and much, much more. It's as near to the real thing as you can get. "HIGHLY RECOMMENDED". You can play against the computer or a friend.

BBC/Electron Cassette £9.95
BBC B/Master 5 1/4" Disc £12.95
Enhanced Archimedes version will be available late October at £19.95

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U.I.M. (ULTRA INTELLIGENT MACHINE)
from The Fourth Dimension

Possibly the most exciting BBC release for a long time. U.I.M is a massive 3D vector graphic action adventure set in the future. The greenhouse effect has melted the icecaps and all life now exists in hundreds of colonies under the sea. You must travel the oceans, completing missions, trading in currencies, commodies and shares in search of the U.I.M. There are many types of ship you will encounter in your highly manoeuvrable futuristic submarine and you must develop your weaponry and equipment to deal with the challenges you will face. U.I.M. is an opportunity to step into another world. It will fascinate you for weeks and possibly months to come.

U.I.M. is disc only and will run on BBC B or B+ with sideways RAM and Master Series Computers. The full colour Archimedes version is due for release 6th December.

Prices above and opposite

M = Master Compatible

TITLE & PUBLISHER	BBC or Electron Cassette	BBC 5 1/4" Disc	Master Compact 3 1/2" Disc
IMPACT SOFTWARE (Discs are BBC B & Master Compatible 40/80)			
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Zenon M	4.95	4.99	6.95
Cheat It Again, Joe 1	2.99	4.99	-
Cheat It Again, Joe 2	2.99	4.99	-
Cheat It Again, Joe 3	2.99	4.99	-
ELITE			
Paperboy M	-	11.95	-
Airwolf (BBC Only)	4.95	-	-
THE FOURTH DIMENSION			
U.I.M. (Disc only-BBC B or B+ with sideways RAM and Master Series) M	-	19.95	21.95
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Holed Out (3D Golf) M	9.95	11.95	12.95
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Holed Out Extra Courses Vol 2 M	9.95	11.95	12.95
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Arcade Soccer M	9.95	12.95	13.95
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Play It Again Sam 5 M	-	-	11.50
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Elite M	-	-	15.75
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Spellbinder M	-	-	7.95
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M = Master Compatible

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ASL		
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Breakthrough M	7.50	9.50
Powerpack 2 (Elec Only)	5.95	-
Thunderstruck	4.95	-
Sphere of Destiny M	-	9.50
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Five Star Games 2 (5 games) (BBC Only)	3.99	-
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M = Master Compatible

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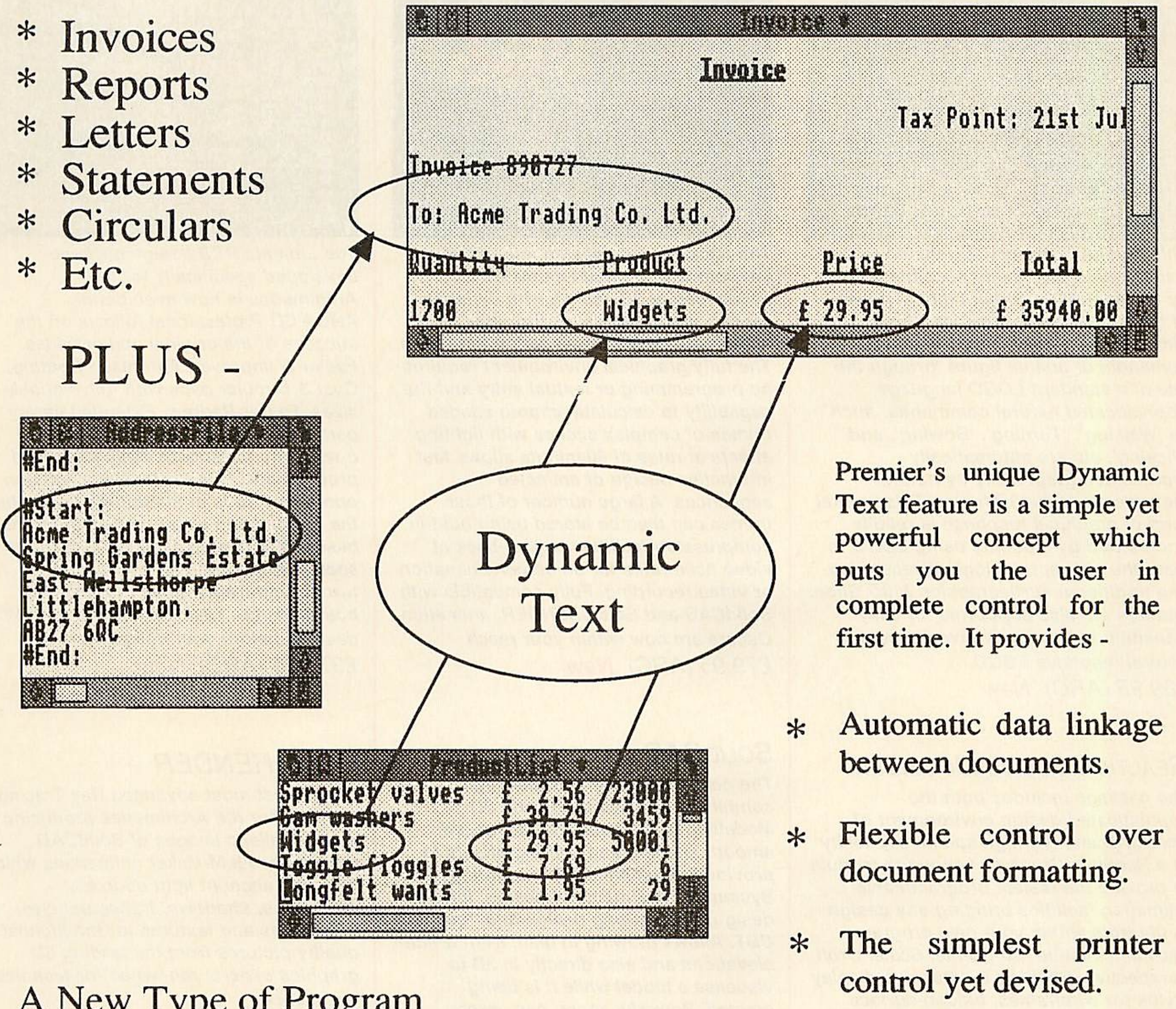
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Premier 3 may be purchased directly by phone, quoting your MasterCard (Access) or Visa card number, or from your nearest Acorn dealer. Educational discounts and multi-machine licences are available.

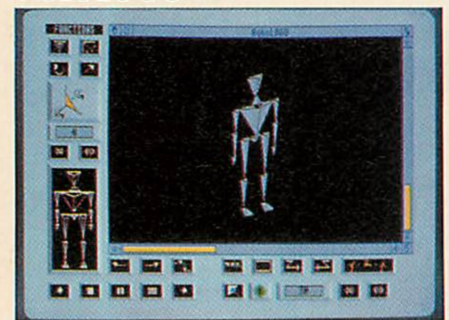
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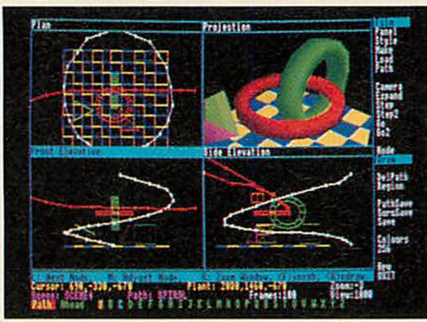
RoboLOGO



This revolutionary new extension to traditional LOGO, made possible only by the enormous computational power of the Archimedes, provides three dimensional control of an articulated humanoid or animal figure through the use of a standard LOGO language. Sophisticated natural commands such as 'Walking', 'Turning', 'Bowing', and 'Picking', etc are automatically represented graphically by natural movements of the 3D figure. This natural form of graphical response is readily understood by students using LOGO to learn the concepts of logic & reasoning. The traditional Turtlegraphics & 3D Glider features are also supported for easy transition to this innovative concept in natural response LOGO.

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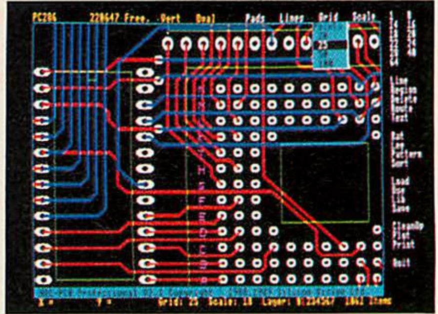
FILM-Maker



The package provides an interactive environment to create animated sequences of 3D scenes with dynamic camera motion for 'walk-throughs' and 'flight-paths' for objects within the scene. The fully graphical environment requires no programming or textual entry and the capability to calculate smooth shaded frames of complex scenes with lighting effects at rates of 60/minute allows fast interactive design of animated sequences. A large number of these frames can then be stored using built-in compression facilities to play-back at video scan rates for on-screen animation or video recording. Fully compatible with SolidCAD and SolidsRENDER, animation Oscars are now within your reach.

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January 1990

Monday 1
Circumcision of Our Lord (Hol)
Think up a hangover cure

Tuesday 2
Back to work!

Wednesday 3
Write thank-you letters:
Auntie Ethel - socks
Uncle Sid - book token
Uncle Ernie - combine

Thursday 4
Only one week to go to the February issue of BAU

Friday 5
Work out how many shopping days left until Christmas

Saturday 6
Epiphany of Our Lord
At last, a holiday!

MAKE A DATE

Whether you want new pages for your personal organiser, or just find out when Easter is going to fall for the next few years, this all-purpose diary manager from **RUPERT THOMPSON** is just right for you

This is a complete diary manager program for easy maintenance of all diaries. The program will print out your diary in a variety of styles (including personal organiser-compatible sizes) and will even automatically insert standard calendrical information (like when Easter, saints' days, and bank holidays fall).

Its great flexibility means it can be used for a variety of purposes – business or personal. I have called the program *Hemera* – the Greek word for 'day'.

The program is very long and has a great many DATA statements which must be accurately copied. You might therefore prefer to buy the magazine disc, which contains the complete *Hemera* program in instant form.

Using Hemera

When *Hemera* is run you are presented with the Options menu. Pressing ESCAPE at any time will return you here should you make a mistake. Options are selected with the function keys.

Before you can use a diary, obviously you must have one! A diary lasts one year only, from January to December, so you will need two, should you need to cover an academic or fiscal year.

A new diary file on disc is created by pressing f5. You must give a file name, in terms of drive number (0-4), directory (single letter) and name. The program will work with ADFS but in this case you should create the directories first.

When you subsequently wish to use your diary, you must open it up, as you would a real book. This tells *Hemera* which file is your diary. You must press f0, and type in the file name as you did before.

However, this is not necessary with a newly created file – creating it automatically opens it for you.

Having created and opened a new diary, you will want to add some information to it. This is the same process as reading the diary and it is done by pressing f1.

You will now see one page of the diary, corresponding to one day. At the top is the date, in double height text and beneath that a special Title field. This is used to contain the calendrical information (saints' days and so forth) or any other 'heading' you want to give to the day.

Beneath this Title field there are 10 Memo fields, which hold your daily appointments, reminders or whatever.

You can move about within the diary by pressing the left and right cursor keys, which flip one day backwards and forwards respectively. For larger jumps press G and

enter a date – you will jump directly to that date. This feature is also available from the Options menu by pressing f3.

It is only possible to edit the diary page on-screen. To edit the Title field, press TAB, while to edit the Memos, press COPY.

Once you are in 'edit mode', the following key functions apply:

COPY – deletes the entire field

TAB – restores the field to its contents on entry

RETURN or UP and DOWN – 'fix' the field

Incidentally, if you want to use this editor in your own programs, it is handled entirely by FNenter() and FNgetcha().

In addition, when editing the Memos (and, incidentally the file name when you open or create a file), the UP and DOWN arrow keys move freely through the various fields, so you can 'go back', as it were, and re-edit a previous field. RETURN or DOWN at the last field fixes all the fields.

Searching questions

Various simple routines exist to sequentially search the diary. These are accessed either through f4 on the Options menu or by pressing S from Edit mode. You are presented with the Search menu.

A search target is selected with f4. This target is the string which will be looked for during the search.

Of course, the search may be made on all the fields, a group of fields or just one field. f3 lets you select the field(s) to be searched and the following codes are used:

A	searches all the fields, memos and title.
T	searches the title field only.
M	searches all memos, but not the title.
1-10	searches that memo field only.

So, the code 5 looks for a match only in memo 5.

Two modes of searching are available – Fuzzy and Specific. They are toggled with f1 and the current setting is displayed at the top of the menu. Fuzzy means that the search is made for a substring, so that if the Search target string is 'Birthday', a fuzzy search will give a match in each of the following cases:

Lucy's Birthday
My Birthday
Nobody's Birthday

A specific search will give a match only if the search target and field being searched match exactly. Then, 'Birthday' would not match with any of the above fields. It would match only with a field containing just the word 'Birthday'. Note that both types of search are case-specific.

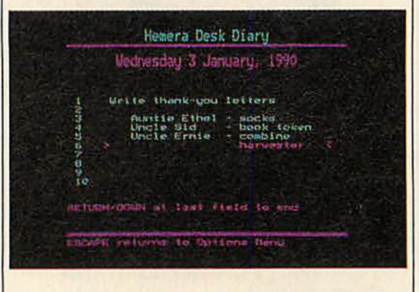
f2 toggles between view and edit modes. If a search is made in view mode, all matches will be displayed sequentially but editing them is not possible without halting the search. If searching is started in edit mode, the first match is displayed with the program switched in edit mode ready for editing the fields. However, the search is then over and only the first match will ever be displayed in this mode.

Press f0 to begin the search. It can be very slow indeed, so be patient! ESCAPE returns to the options menu.









Create and maintain your very own style of diary

Memorable dates

Back on the options menu, f2 automatically inserts calendrical information to the title field – including Easter, saints' days and bank holidays. The process of predicting bank holidays is not 100 per cent certain and remember that bank holidays can always be changed by the Government!

Treat *Hemera*'s predictions only as a guide. Its religious dates are exact, though.

Desk copy

Hemera's most impressive function is perhaps its printing routines. Press f6 to see the printer menu. Any style may be printed simply by pressing the corresponding function key.

You may print either one month or a whole year at a time, and if more than one page is to be printed you may ask for a pause between each, allowing cut sheets to be used. In addition, because 'A4' sheets are seldom exactly A4-sized, especially with computer stationery, you may set the page length yourself.

Of course, all 10 memos cannot be accommodated on diaries of all sizes. The following table shows how many fields are displayed on each. The title field is always displayed.

	A4 Size	FiloFax
Day per Page styles	10	10
Week per Page styles	4	1
Month per Page styles	1	0

If you print out a diary, you will see that on alternate pages the dates swap sides. This is so that if you print on both sides of the page, the writing is always on the outside, just like in a professionally made diary.

Personal organiser-sized tractor feed paper is available from Mewsoft (11 Cressy Road, London NW3 2NB. Tel: 01-267 2642), although this is technically one line too short.

Proper-sized paper can be found in computer stationery shops and usually at the *BBC Acorn User* shows, but it is expensive.

As a cheaper alternative, you could always use pre-cut organiser sheets, available in lots of colours from W H Smith, Ryman, Dillons, Athena and so on, but this can be fiddly.

A better solution is to print on ordinary paper and then cut to size later (a true FiloFax sheet measures 171 x 96mm).

As for the holes, you could, using a real FiloFax sheet as a template, punch them with a single hole punch, available for a couple of quid from stationers. If you are going to be punching a lot of sheets, you might like a six-hole punch. The official FiloFax version, as befits its pedigree, is rather expensive, but Sasco make a cheaper,

plastic version, available from Argos or from WH Smiths for about £10.

However you print out the diaries, even if you have to buy a hole punch, *Hemera*'s organiser size diaries will work out much cheaper than their professional equivalents!

The program

Although not essential by any means to actually using the program, it may well be helpful to have some understanding of its workings (you may want to alter it!).

I will introduce the various routines which handle all the calendrical manipulation (or operations on dates). All the routines bar two lie between lines 1000 and 1410. Refer to the yellow pages.

Because calendrical manipulation can seem rather daunting, we'll start off with an easy function, and work our way up. During these routines, the following variables refer only to these quantities:

- Y% denotes a year number, eg 1990.
- M% denotes a month, in the range 1-12.
- D% denotes a day, as found in dates.
- T% also refers to a day but as its position within the year (ie 1st February is day number 32)

FNcentury(Y%) returns the first two digits of the year number, that is the century number. It is used exclusively by other calendrical manipulation routines. Similarly FNyear(Y%) returns the last two digits, that is the number of the year within its century. These two are very simple and need no further explanation.

We can test for a leap year with FNleap(Y%), which returns the value -1 for a leap year and 0 for a non-leap year. A year is leap if it is divisible by 4, unless it is a century year (eg 1900), in which case it must be divisible by 400 to be leap. FNleap uses FNyear to test for this.

FNday(D%,M%,Y%) returns the corresponding value of T%, the number of days elapsed since 1 January. It does this very simply. It adds up the number of days in the preceding months (contained in line 1290), adds on the value of D%, the day number and then adds an intercalary day if it is a leap year.

Line 1280 performs the correction for a leap year – note the negative sign because the bracketed expression, ((M%>2) AND FNleap(Y%)), has the value -1 if it is a leap year, and the month comes after February. Otherwise it has the value 0.

So, subtracting will actually add 1 for 29 February if it exists. This function is used to determine where a particular day may be found inside the diary.

FNddate(T%,Y%) returns the number of the day within its month, where T% is the number of the day within the year. FNmdate(T%,Y%) returns the month number. Both are really the reverse process of FNday, and need no further explanation.

Note that this function will return the last few days of each month as negative numbers. It is therefore not suitable for working out days at the close of the months. This does not matter to *Hemera*, though.

FNweekday(D%,M%,Y%) returns the day of the week. The value returned is a number from 0 to 6, 0 being Saturday, 1 Sunday and so on.

You should now be able to cope with the function to calculate Easter, upon which all the movable feasts depend. Easter depends upon the date of the Paschal new moon, and as such its date can be predicted accurately by reference to astronomical tables.

One such method is expounded, in very archaic language, on pages 33-34 of the Book of Common Prayer. The method, which is valid until 2099 AD, involves finding two values for the year, called the Golden Number and the Dominical. FNeaster(Y%) calculates Easter.

To find the Golden Number, add 1 to the year number and divide by 19. The remainder is the Golden Number. This is handled by FNgoldn(Y%).

To find the Dominical is somewhat more complicated. Add to the year number a quarter of itself, discarding fractions. Add the number 6, and divide by 7. The remainder indicates the Dominical. This is handled by FNdominical(Y%).

FNeaster then cross-references these values according to the table in the Book of Common Prayer (which is contained in lines 1070 to 1250). This gives the day and month of Easter for the year, and it is then converted to the number of the day in the year by FNday.

The last two functions are very simple. They are found in lines 3150 to 3180. FNdname(T%) returns the name of the day of the week whose number is T%. Thus if T%=0, the function returns 'Saturday'.

Similarly, FNmname(T%) does the same with the month name, T%=0 returning 'January'. Note the different use of T% in these two functions.

So, this New Year you have no excuse for forgetting all those important days. *Hemera* will see to that.

```
January 1990
1  M Circumcision of Ou
2  T
3  W
4  T
5  F
6  S Epiphany of Our Lo
7  S
8  M
9  T
10 W
11 T
12 F
13 S
14 S
15 M
16 T
17 W
18 T
19 F
20 S
21 S
22 M
23 T
24 W
25 T Conversion of St P
26 F
27 S
28 S
29 M
30 T
31 W
```

```
January 1990
Monday 1
Circumcision of Our Lord (Hol)
Think up a hangover cure
Tuesday 2
Back to work!
Wednesday 3
Write thank-you letters:
Thursday 4
Only one week to go to the
February issue of BAU
Friday 5
Work out how many shopping
days left until Christmas
Saturday 6
Epiphany of Our Lord
At last, a holiday!
```

```
January 1990
Monday 1
Circumcision of Our Lord (Hol)
hangover cure
```

Hemera keeps track of all your memorable dates

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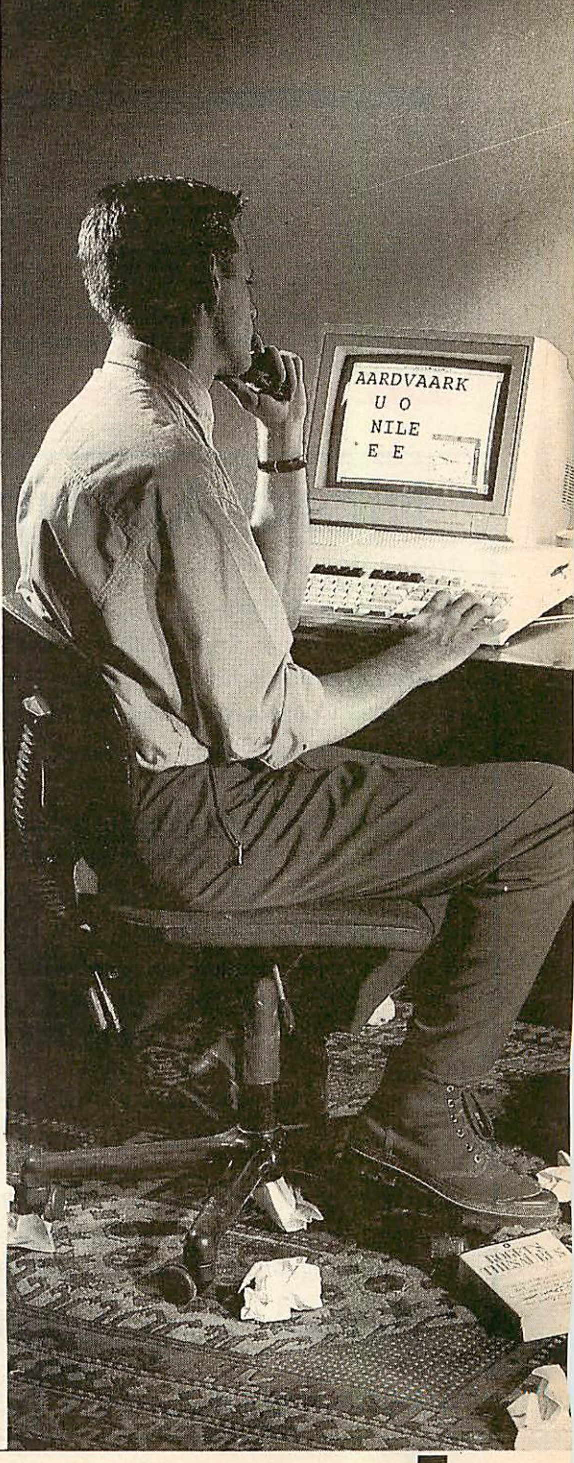




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DAVID LAWRENCE presents some pretty mind-bending word game programs which are sure to amuse you

GROWS EDAM



PHOTOGRAPH BY NICK DICKS

Well, if you haven't worked out what the title of this article is yet, then I guess word games are not for you, and perhaps you should turn to page 103 where there is a rather nice review of... But seriously, word games are one of the most popular pastimes of the British public – you only have to wander into WH Smith to see the plethora of puzzle magazines devoted to this activity.

It is quite amazing in itself how the puzzle compilers manage to come up with more and more fiendishly cunning ways of concealing words. Even the humble crossword can vary between the quick variety in the daily tabloids, with such wonderful clues as 'Household pet, three letters, begins with D' up to the mind-bending double reversed anagramised acrostic sort with no black squares or numbered clues reserved for one of the more bizarre sections of the Sunday supplements.

On a more mundane level, and certainly within the scope of a magazine article, come the relatively simple puzzles and games such as word squares, hangman, mastermind, anagrams, trackwords and hidden words. Unfortunately, the algorithms behind the classic word game, Scrabble, are non-trivial and deserve more than an article to do them justice.

In the rest of this article, I will cover the techniques involved in three of these games and I leave it as an exercise to the reader to extract the relevant routines from these and write the others. Presented below, then, are a wordsquare generator, a trackword solver and an anagram finder. There's also a program, that although it is not a word game itself, does play games with words and for this reason seemed worthy of inclusion.

The first three of these programs all need access to a dictionary of words. If you do not already have one (usually in the form of an electronic spelling checker), then I strongly recommend *Spellmaster* from Computer Concepts for both BBC and Archimedes owners alike. Indeed, most of the programs in this article were written with BBC *Spellmaster* in mind. However, don't worry if you don't have it, as routines are provided for accessing the *Viewspell*, *Romspell* and *Pipedream* dictionaries to a certain extent.

Unfortunately, due to rather extensive memory requirements, some of the programs will only run on an Archimedes. These programs are all clearly indicated, so don't start typing in the wrong ones.

Getting started

Before getting stuck into the main programs, a couple of rather essential functions need to be introduced. These are FNcheck and FNpick. They check to see if a word is in a dictionary and pick a random word from a dictionary respectively. FNcheck takes at least one parameter, the word to be checked, and returns 1 if the word is present and 0 if it is not. In most cases (sic), the case of the word is significant. For example:

```
>PRINT FNcheck("ZUWEEBIA")
         0
>PRINT FNcheck("RHOMBUS")
         1
>PRINT FNcheck("Rhombus")
         0
```

FNpick usually takes no parameters, but



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merely returns a random word from the current dictionary:

```
>PRINT FNpick
OSTRICH
>PRINT FNpick
AGITATED
```

I have written versions of these routines on both machines that cover the use of *Spellmaster*, *Romspell* and a general purpose dictionary file that should cover most other spell checkers. The table below indicates the functions available and their names in the yellow pages:

	FNcheck	FNpick
BBC SpellMaster	BC-SM	BP-SM
BBC RomSpell	BC-RS	[BP-File]
BBC ViewSpell	[BC-File]	[BP-File]
Arc SpellMaster	AC-SM	[AP-File]
Arc PipeDream	[AC-File]	[AP-File]

The bracketed filenames indicate that the dictionaries need to be spooled and the general-purpose file access routines should be used. Full instructions are given below.

BBC Spellmaster

My main critism of *Spellmaster* (in both its incarnations) is that there is no easy way to access the dictionary outside the use of the * commands provided. For example, when using *CHECK to check a word, if the word is valid, then it is printed, otherwise an error is generated – not very useful. Consequently, I had a quick peek through the Rom, and extracted the appropriate machine code to gain access to the dictionary. This can be found in the PROCcode sections of both *BC-SM* and *BP-SM*. Very briefly, the dictionary is indexed by the first two letters of the word and there are a couple of Rom routines that initialise a search and return the next word respectively. These I have called sminit and smnext. Note that smslot should be changed to the Rom slot your *Spellmaster* is in.

To check a word, the first two letters are stored in the appropriate locations and sminit is called. If the carry is set, then there are no words at all beginning with those letters and the search returns 0. Otherwise, smnext is repeatedly called until either the carry is set, indicating the end of the list of words, or the word returned is the same as the one entered, in which case the word is valid. The routines called make extensive use of zero page, and I have not been able to work out what all the values I am initialising do! However, the most important ones seem to be:

&69	First letter of word
&6A	Second letter of word
&9273	Initialise dictionary for search
&98AC	Get next word and store it...
&632	...here!
&66	Length of returned word.

Picking a random word is slightly more tricky as it is not possible to jump straight to a given position in the dictionary.

Instead, the routine picks two start letters at random and counts how many words begin with those letters. Then it picks a random number less than this value, and steps through the list again until that word is reached. This is rater contrived but does actually work!

BBC Romspell

Dictionary access is one thing that Watford got right with *Romspell*, and although the program is disc-based and rather slow, I think you'll agree that *BC-RS* is slightly simpler than the *Spellmaster* routine!

Unfortunately, I couldn't think of any easy way to write FNpick, so perhaps one of you might like to get delving into the *Romspell* Rom...

Viewspell

The same problem crops up with Acorn's own *Viewspell*. There is no easy way of getting access to the words. However, I have provided the routines BC-File and BP-File which will work with any spooled dictionary. First the *Viewspell* dictionary needs to be saved in plain text form. This can be done be going into *Viewspell* in the usual way, [*SPELL?], and typing:

```
=> *Spool VDict
=> SE *
 a-bombs a-bomb aardvark .....
=> *Spool
```

The junk at the start and end of the file should then be edited out, each word terminated by a single line-feed (Ascii 10) and the final list of words sorted alphabetically. Note that it is essential to sort the file for FNcheck to work correctly although FNpick will work with any file.

FNcheck and FNpick now need an extra parameter – the name of the dictionary file, so to check if the word 'Grunties' is in the dictionary you use:

```
IF FNcheck("Grunties","VDict") THEN ....
```

and to pick a random word you use:

```
rnd$ = FNpick("VDict")
```

Arc Spellmaster

I have only just got hold of Arc *Spellmaster*, and so have not yet had time to write any dictionary access code. It is, however, possible to write a Basic function that uses local errors to return the desired values. This can be found in the *AC-SM* program, but this is not ideal, especially as I don't really trust local errors!

Personally I use a large spooled dictionary combining *Spellmaster* and *Pipedream*. These can then be reasonably quickly accessed using AC-File and AP-File. Indeed, when stored on hard- or Ram disc FNcheck-ing and FNpick-ing are weally wather wapid!

The *Spellmaster* dictionary can be spooled very simply with one command:

```
>*Check * { > SMdict }
```

Likewise, an option is provided on the *Pipedream* 'Spell' menu to spool the dictionary. As with the BBC dictionary files, you will need to strip out any junk in the files, terminate them with Ascii 10s and sort them alphabetically. The file-based FNpick is easy to follow. The file is opened and its length found using EXT. A random number less than this value is then assigned to PTR – the file pointer. Characters are then read until an end of word marker is found, then the next word is read in and returned from the function.

FNcheck is slightly more contrived, as it uses a binary chop to cut down the search time. As before the length of file is found with EXT, PTR is then positioned in the middle of the file with a value of EXT/2, and a step value is set to half of this value, making it EXT/4. The function getword is then called to return the word in the file that PTR points to. This involves stepping backwards through the file until an Ascii 10 is found, moving forward one character and then returning the next word. This new word is then compared against the word to find. If it matches, then the word exists and the function returns 1. If it is 'less than' meaning earlier in alphabetical order, then the step value is added to the file pointer. If it is 'greater than' which means later in alphabetical order, then the value is subtracted. This process is repeated until either the word is found, or GETWORD returns the same word twice in a row, in which case the word does not exist.

If you have a different spellchecker, access to another dictionary or know of better ways to access the dictionaries above, then you merely need to rewrite FNcheck and FNpick. *BBC Acorn User* would also be very interested in any further versions of these routines.

Phew! At least that lot is out of the way, now we can get on with the games...

Wordsquares generator

Wordsquares or wordsearches are simple in concept, but can be very tricky to solve. For those of you who don't know what a wordsquare is, see if you can find the following words in this grid of letters:

BBC	ACNOLU
ACORN	BDROWS
USER	RBOSPE
WORD	WDCAIR
GAMES	JGAMES

I think you'll find the puzzle is completely self-explanatory! The problem with wordsquares is that although they are constructed from a few simple rules, they are time

consuming to compose by hand. It is also quite tricky to make one for your own amusement, as, you know where you put the words! Well, why not use your old pal, the computer, to do all the tedious bits, and you can just sit back in front of the fire with the resulting piece of listing paper and solve the accursed things all evening.

To get started, simply type in the WSQG listing on the yellow pages. You will need to replace FNpick at the end of the program by the appropriate routine for your dictionary. If you are using a file-based dictionary, you will also need to put its name in the call to FNpick, which has been REMed. All being well, you should then be able to run the program with no problems.

The screen is divided into five main areas. These are (in no particular order):

The wordsquare grid in the top right hand corner. This is where the wordsquare is constructed. Unfilled squares are represented by the small white boxes.

To the left of this is the current status box which contains the current state of the control parameters. At the start, one of these will be highlighted, the highlight bar can be moved up and down with the cursor keys and the various values altered with the left and right cursor keys. These parameters will be explained in full later.

Below the status box is the options box. This contains the list of commands the program responds to. To select a command, simply press its initial letter.

The box in the bottom right hand corner is the word list box. This will initially be empty, but will eventually contain the list of words to be fitted into the wordsquare.

Finally, to the left of the word list box, is a small message window that is used by the program to indicate what is going on.

Using the program

Assuming the program has been correctly entered and you have added an appropriate FNpick routine, simply run the program and press W. This will select a list of random words and place them in the word list window. The number of words is controlled by the Num Words option in the status window. This can be varied between 0 and 40. 0 is a special case and allows you to enter your own words (see later).

Fairly obviously, the 'Min Length' and 'Max length' options allow you to restrict the length of the words picked. Once a list has been picked, you are not allowed to alter Num Words, if you want to use a shorter list, press C, alter Num Words and press W again.

If you are unhappy with any of the words picked, highlight the word in the word list window with SHIFT cursor keys and press E. You can then edit the word with DELETE, CTRL U (to clear the word), TAB (to restore the word) and the ordinary A-Z keys.



```
+----------------------+
:ORDCCRAHEPICUMIFORMB:   ELEPHANT
:AOMCBEERLFPHAHAPPIRC:   ARCHIMEDES
:OFEAKRTIAFCECNENTNEC:   BBCACORNUSER
:ERELNGBUPMIRIBIORTRR:   COMPUTER
:OERSRCRAPIABSBEOSIIP:   PERFORMANCE
:NPNOIAEICMEAOCCERGVM:   GUITAR
:EEMEGISRAEOCRAPIUECT:   AMPLIFIER
:CRBNVCUEBBOESCERIGII:   DIGITAL
:EBIOIINICEBUOBHTMBID:   NOISE
:TOVPALRILGAISUIIOGPR:   HERBACEOUS
:INLGMEOETUPMOCAMCRUO:   PAPER
:IIBBCACDIEMANUGEAPNR:   TIGER
:LCFPMLATITRDHUCDORTN:   COCKROACH
:NRLRDRHGBLATICVEERAL:   VIOLIN
:KBPEREIFOBIUPEASRHEE:
:LOCPEDAICEBNASGOPNIT:
:RPRKPPVLBULPEPTEROEH:
:LRCLABCPIOREIALMRKLF:
:TOATIUGMEREREEPCCOCR:
:CEHKGODAILGFORMALRNU:
+----------------------+
```

Your micro composes wordsquares

RETURN will then store your new word.

To construct a wordsquare press M. This will highlight each word in turn and place it in the word grid. It's quite likely that it won't be able to get all the words on the grid, if the program seems to have hung, pressing ESCAPE will return control to you.

Three of the status parameters have direct control over the way in which words are placed on the grid. From the top these are: Entries, this is usually 1, but can be anything up to 40. It controls how many times each word is placed on the grid. This can make the final puzzle more challenging as you will have to find more occurrences of the same word. If, however, you set 'Short' to 'Yes', then only the first entry will be real, as the subsequent ones will be shortened versions of the same word. This just means there will be some misleading starts. Finally you can alter the style of the grid. Currently there are five styles:

Orthog	Words placed only vertically and horizontally (backwards and up are allowed)
Star	Words placed in all eight directions. The default setting
Angled	Words placed only along the four diagonals.
Biased	All eight directions are used but it tends not to use the 'easily readable' ones - right, down and diagonally right down
Dogleg	All eight directions are used but one random 'kink' is used. This form is the most challenging as the words actually change direction

Once a grid has been generated, the blank spaces need to be filled in with other letters. There are two ways this can be done, controlled by the Random fill option. A random fill involves filling the gaps with completely random letters from A to Z and switching this to 'No' means that the gaps are filled with letters only from the words in the word list. This means you cannot immediately discard all the obviously wrong letters in the grid.

The final stage is obtaining a hard copy of the finished square. Make sure your printer is attached and online and press P. This will dump out the wordsquare and the word list. If you want a solution to the grid, press F again, to remove the surplus filling letters and reprint the grid.

To start a new grid, press C and start again, to quit the program press Q.

If you want to enter your own words, but still get the computer to place them on the grid, set the Num Words option to 0 and then press W. A cursor will appear in the word list window in much the same way as using the Edit option. You are then free to enter words. A word will be rejected if it exceeds the maximum length or is less than the minimum length. As you type in words, the Num Words entry will be updated to show the number of words entered. To finish entering words, enter a blank word by simply pressing RETURN.

How it works

There is nothing amazingly complicated in the program and most people should be able to follow it through. For the interested, though, here is a brief run-down of the more interesting features.

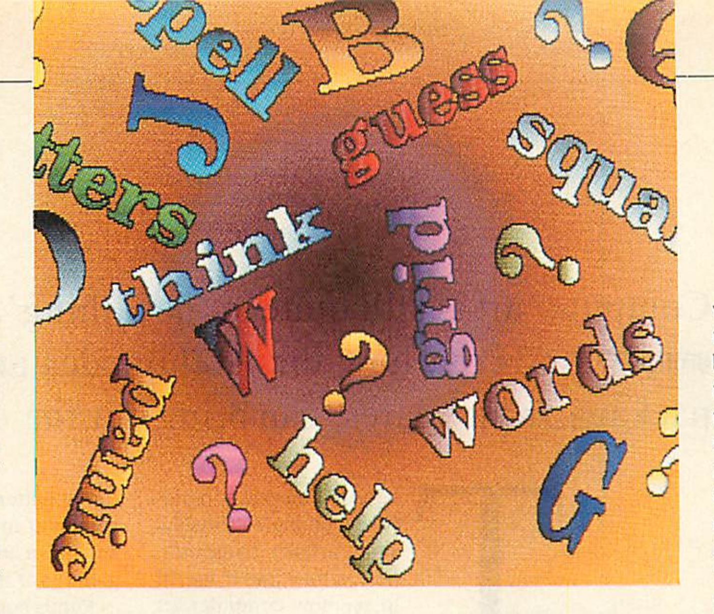
PROCinit is used to set up all the arrays and variables used be the program. The actual grid is stored as a 400 byte array called grid. This is then accessed using FNpeek(x,y) to read values and PROCpoke(x,y,v) to write values. The variables displayed in the current status box are stored in the array var and indexed with the variables 'words', 'minlen' and so on.

The DATA statements contain the status variables and how they can be altered, the command table, numeric representations of the eight directions and finally the various styles of wordsquare along with their directional weightings. PROCbox is used to draw the screen windows. FNinfo and FNopt respectively display the status information and command table. PROCselect is the main loop of the program. It waits for key presses and either moves the cursor, alters variables or dispatches control to one of the main subroutines.

This is done with the old trick of EVALuating null functions to save on having huge lists of IF opt=... THEN PROC...

FNwords builds the list of words using either PROCmanual for user words or PROCauto for random words.

FNmake performs the actual construction of the square. It takes each word in turn and places it on the grid 'entries' times, truncating the word if 'Short' is on. Word place-



ment is dealt with by PROCplace. This picks a random start point and random direction, the direction picked is weighted according to the style to allow for the various types of grid. In the case of 'DogLeg', secondary direction and change point are also picked. The word is then tried at that position. If it goes off the side of the grid or overlaps another word, the position is rejected and another chosen, otherwise it is permanently PROCpoked onto the grid.

The blank squares are filled with FNfill, these dummy letters have their top bit set, meaning they are greater than 128, so they can be toggled on and off by subsequent pressings of F.

Finally, FNprint deals with hardcopy. It switches all output to the printer with *FX 3,10 for convenience and then reduces the line spacing to make the square actually appear square. It then prints the actual grid along with the word list in two columns.

Trackword solver

As with crosswords and wordsquares, there are many varieties of trackword. Most daily papers seem to have one in form or another. The program presented here (called 'Track') will solve the sort that used to appear in the back pages of the *Radio Times*. The puzzle is quite simple: a nine letter word such as 'Fabricate' is hidden in a three by three grid in such a way that it is possible to 'track' from each letter to the next either vertically, horizontally or diagonally, for example:

```
A I R
C T B
F A E
```

The puzzle involves finding as many words as you can (including the original nine-letter word) in this grid by using this tracking rule and without using the same letter more than once. In the above square, all the following words can be found: AIR, ACT, FATE, TRIBE.

The Track program takes all the fun out of this and finds all the words for you! Type in the program as listed and replace the FNcheck as necessary. Don't forget you may need to alter the REMed line as well.

About half way through the listing you will find three DATA lines that correspond directly to the square above. These should be changed to match the trackword that you wish to solve. Running the program will then produce a list of the words found, the number found and how long it took. Note that it will not spot if it has already found the word a different way, for example it will find ATE twice in the above square.

The basis of the program is the recursive procedure, search, that simply adds a letter to the current word and then calls itself for the eight squares around it. On each call, it checks if the current word is valid and prints it out if it is. It also marks the letter as 'used' (by negating it) so it is not used again later in the word.

Don't worry if nothing seems to happen on running the program, it takes a long time to check all 10,305 possible words.

Anagrams

This is a very large program that will only work on an Archimedes. The original search algorithm did start out in Basic on a Compact, but this proved far too slow to be practical. The extra memory and, of course, processor speed available on the Archimedes allowed the speed of the algorithm to be increased dramatically. This, coupled with a cunning method of storing words, means that it now bombs along at an inordinate rate of knots!

I won't explain how the program and its algorithm works – maybe in another article. If however, people do want to delve, the code was written using my patent method of 'random programming'...

I hope the program is pretty much self explanatory, out of its 14K, 9K is actually front and back end. You could actually make do with only 5K of it!

You will need a spooled dictionary with the words separated by carriage returns (Ascii 13). This should be called 'Main'. Personally, I also have a dictionary of first names called Names, a copy of which you will find on the monthly disc.

To start with, the program attempts to copy these dictionaries into the Ram disc to speed up access. Again, don't worry if you don't have a Ram disc, as the program works pefectly from hard or floppy disc. Once installed, you should be presented with a ']' prompt. The best thing to do now is type H and press RETURN. Note that the H is automatically extended to become 'Help'. This will then give you a list of the valid commands.

To find an anagram, press A (extended to Anagram) and then type in the word or words you want anagramised eg. *'BBC Acorn User'* and press RETURN. Note you can freely mix upper and lower case and add as many spaces as you like, since they will all be ignored. The case of the printed output is controlled by the case of the letters within the spooled dictionary. To start the anagrammer press G and RETURN and a little row of dots and stars will appear to indicate that an initial search is going on. When this disappears the list of anagrams should appear. When the prompt returns, press S and the status of various variables will be displayed.

Nonsense

While playing around with the above programs, I had the idea for this nonsense generator. There are numerous little programs that generate random sentences from a given list of adjectives, adverbs, nouns and so on and although quite amusing at times, these are rather inane. They will always produce the same type of sentence – for example, the very simple 'noun verb noun'. So as a test, I wrote the Wurdz program reproduced in the yellow pages. Due to the very extensive memory usage of this program, it will only work on an Archimedes.

The difference between Wurdz and the previous programs is the source of its words. Instead of having a fixed list of words, you must feed it text files.

It then breaks these down into their component words and builds up a table containing these and those that follow them. For example, if it scanned the sentence, 'The cat sat on the mat', the table would look a bit like this:

```
The    cat    sat    on    mat
  cat    sat    on    the    .
  mat
```

Meaning that 'cat' can be followed by 'sat' and 'the' can be followed by 'cat' or 'mat'.

Once the file is scanned, a random start word is chosen and a function is used to return one of the valid 'following' words. This process is then iterated until you tell it to stop (by pressing ESCAPE). This tends to produce text similar in style to the original and also in most cases is quite readable, if rather bizarre! I recommend you strip out all control characters and rulers or whatever before scanning. This will produce nicer looking output. Also note that '.','!' and '?' are treated as ends of sentences.

I fed in this article and among the strangest sentences were:

'Oh well, you may need to spool the options box.'

'The final puzzle is set, then it scanned the search time.'

'Even the British public – you do them justice.'

I just wonder what would happen if we fed the whole of this issue in...?

Due to lack of space programs for the Arc are available on the 3.5in disc only.




Computer art is still quite a 'new thing'. Art teacher, **STEVE BRUNLETT** finds out how the Archimedes and the Proartisan package from Clares, can bring out the artist in everyone

ART ATTACK

The Archimedes is rapidly becoming established as an artist's computer. So you may find it useful to see how computer art programs are actually being used in practical terms.

I recently completed a week as artist-in-residence at Cartwright Hall in Bradford. The residency was organised as part of parallel activities to the touring Art and Computers exhibition which has been on show in various parts of the country during the past year and which was on show in Bradford during April and May.

Alongside the exhibits in the Art and Computers exhibition there was also an exhibition of work by pupils at my school (Honley High School) as well as some of my own work.

The pictures on show were produced using a video digitiser and *Proartisan* and illustrated the possibilities for the use of video imagery in the production of computer aided art and design work.

Four Archimedes microcomputers were used exclusively for the whole of the residency. The residency comprised a week of half day workshops for schools, a full day Masterclass for adults and a full day of demonstrations for the general public. *Proartisan* was used throughout.

One of the first workshops was with a group of 14 boys and girls aged nine-10 from Newby First School. The project for the workshop was based on examples of Indian textiles produced for a bride's dowry from the museum's own collection.

These were mainly garments put together from smaller patches of textiles with a wide variety of geometric and animal-based patterns. The pupils worked on the computer in pairs for part of the workshop and on an art project at the other side of the gallery for the rest of the time.

Pupils not working on the computer were using traditional materials to produce collages based on the examples of textiles they were shown.

The work done on the computers involved pattern making based on motifs from the Indian textiles, starting with simple overlaid triangles, rectangles and circles in different colours then repeated to create a textile design.

Most pupils worked on a grid to keep the shapes within a square area of the screen to make it easier to repeat the shapes and produce a full screen repeat pattern. Some worked only on a general area of the screen. By cutting and pasting part of their work and repeating it to fill the whole screen, some very successful designs were produced (See the two at the top of this page).


One of the best pieces - 'drawn' by a novice

I've never seen such enthusiasm for this kind of computer aided art and design work before

The square-based textile designs were produced by flipping and copying the design produced by the pupils. The pupils only worked on the original single square motif and the repeat pattern was produced for them on completion of the motif.

The most productive workshop was a very intense three and a half hour session with a group of 12 pupils aged from six to 16 and five adults. The pupils were part of an Education For All group whose parents educate their children at home but who use a variety of school and museum-based facilities to extend their children's education into areas they have neither the funds nor expertise to organise.

The group wanted to work individually on the same theme of faces. Some of the

younger pupils produced very dynamic portraits similar to those they may have produced with paint or crayons at home.

By using the computer they were able to turn them into textile designs or make them into a more complex image by repeating them in different sizes in a number of different ways.

Most of the older pupils struggled with the computer and software, but one 13 year old girl pushed the limits of the computer and myself as far as possible to do what she wanted without being limited by what she'd been shown.

She built up an image of a face with repeated faces in the background as a kind of textile design. The faces had been filled with a detailed colourful texture that she'd produced using a variety of brushes of different size, shape and colour.

The workshop held on Saturday was a whole day workshop bookable for a fee by adults only, many with some experience of computer-aided art and design.

Some of the students worked very fast and explored the effects and tools available as they went along.

One picture, produced by one of the adults, was based on a bronze figure at the side of the computer and developed in stages to produce a superb 'drawing'.

The other piece of work based on the same bronze figure was developed into a freer, more painterly image.

The last day of the exhibition was one of continuous demonstrations for visitors to the exhibition where members of the general public could 'have a go'. One of the best pieces of work to be produced on the final day for the general public was 'drawn' by one of the gallery staff.

The residency was a worthwhile experience for me both as an artist and a teacher. As this is a new art form for most pupils and adults, most of my time was taken up explaining and demonstrating what the equipment and software could do.

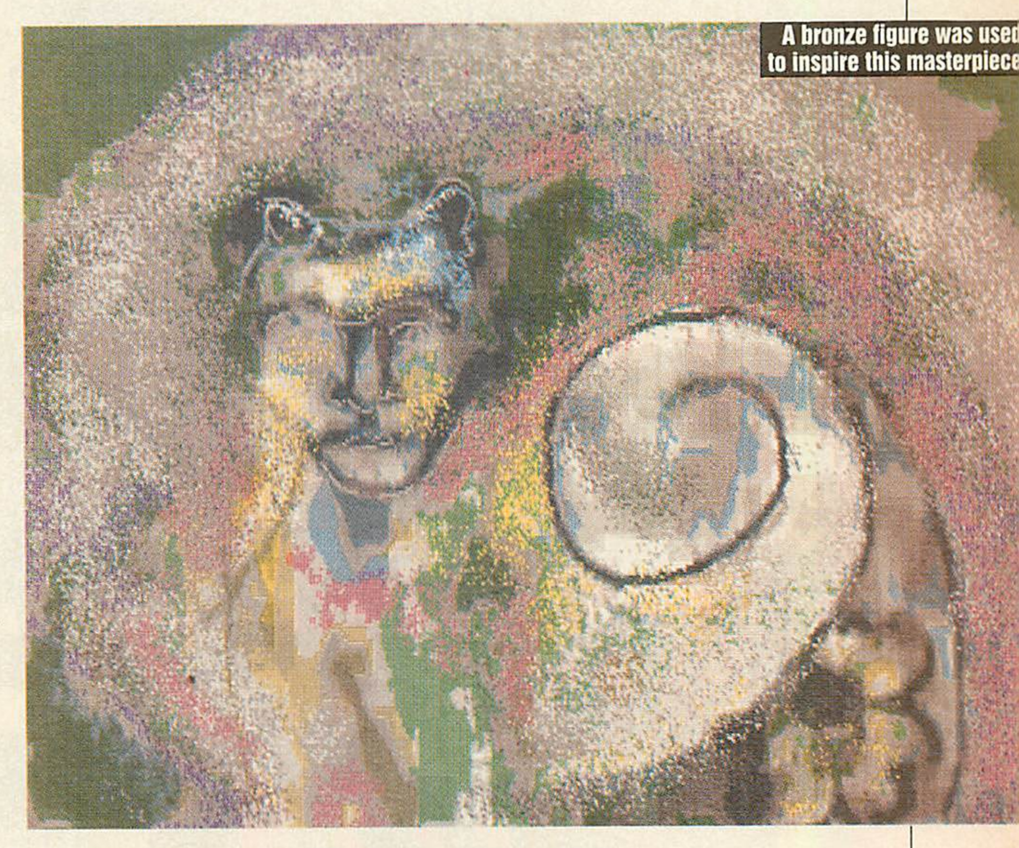
The most rewarding part was the Education For All group. I haven't seen such enthusiasm for this kind of computer aided art and design work before.

If anyone doubts the wisdom of using a professional package with young children, the six and eight-year-olds who used it in the workshops to produce drawings of themselves took to it like a duck to water.

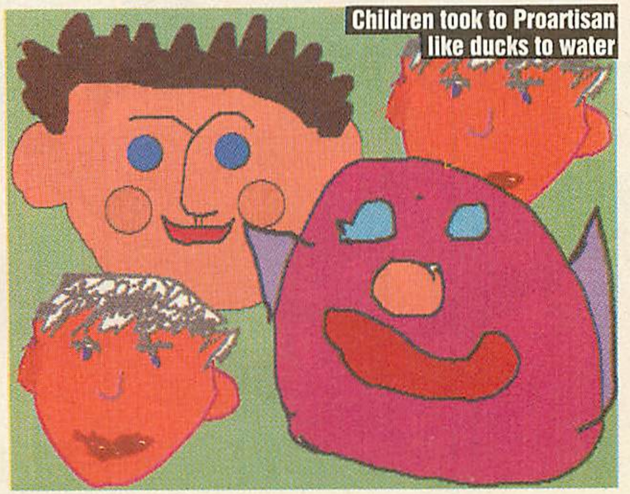
The other pupils managed to use the paint facilities with no problems and became critical of the shades they were using in their pictures when painting, drawing or filling.

Older children and adults used the cut-and-paste facilities with very little instruction, experimenting with the options to get the effect they wanted.

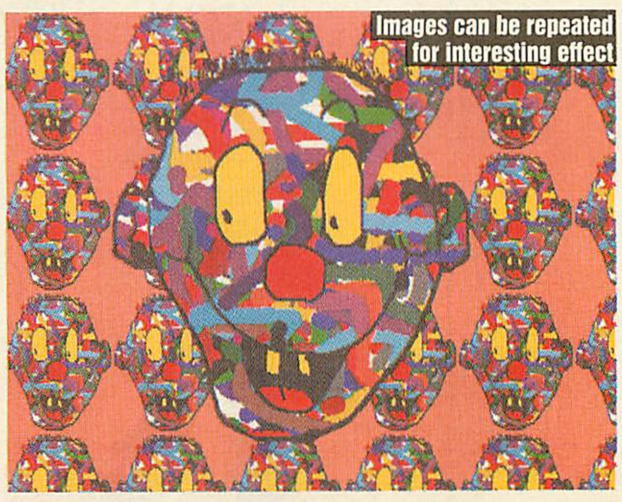
By the end of the week I was glad to get back to school and wonder where my Easter holiday had gone.



A bronze figure was used to inspire this masterpiece

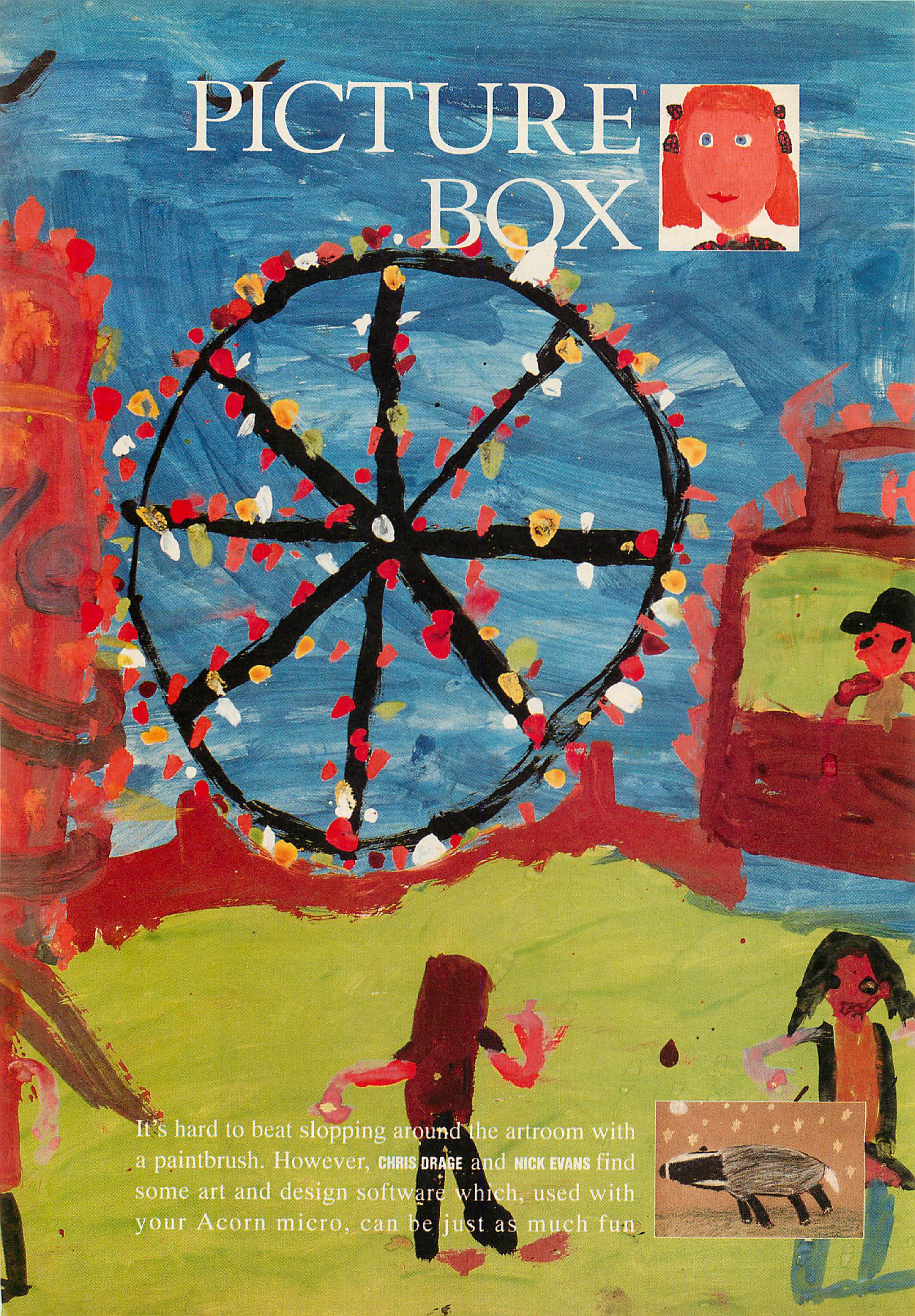


Children took to Proartisan like ducks to water



Images can be repeated for interesting effect

PICTURE BOX



It's hard to beat slopping around the artroom with a paintbrush. However, CHRIS DRAGE and NICK EVANS find some art and design software which, used with your Acorn micro, can be just as much fun

Computer art and design software offers children alternatives to traditional classroom materials. In this context, 'picture processing' provides the same dynamic approach to editing as word-processing does for writing.

In exploring new horizons, children need to develop concepts and skills associated with graphic art software which are commensurate with their age and maturity. As so much art and design software has become available for the Master 128 and the A3000, such a developmental approach is now perfectly possible.

For very young children software must have facilities which can be grasped quickly and efficiently despite minimum language ability. Such a package is *Paint Brush*, best used in conjunction with the Robin Light Pen (see *AU* Nov 85).

The success of *Paint Brush* is entirely due to its simplicity, enabling children to get down to work, creating vivid, screen images almost immediately using a device which is not unlike an 'electronic crayon'.

Paint Brush may be made to draw lines, triangles, rectangles and filled or unfilled circles of all sizes. All effects, including text entry and filling, are possible by selecting a colour with the light pen then issuing a single letter command.

A suitable package to move on to might be *Picture Craft*. Intended for ages six to 14, it allows children to design and create pictures using a set of shapes. A set-up menu enables teachers to select from a large number of options controlling picture design and painting, filling and printing. These may be set according to the ability of the child, so the program appears as simple or as complex as the teacher wishes.

Image is perhaps the most comprehensive disc-based art software for the BBC B/Master 128. A wide range of input devices can be used with it and images can be taken from any number of sources, including digitised pictures. It can also output to a variety of printers.

The package offers techniques for designing patterns and textures and uses basic geometric figures, arcs, rays and dots to make the shapes required. Once created, a particular shape may be compressed in a number of ways, reflected and rotated. Included too is a Sketchbook disc which allows different variations on a particular theme to be attempted while the main idea is saved and kept elsewhere.

Risc micros also boast a range of quality art software whose overall performance is in excess of anything achievable on the eight-bit machines.

Picture Builder has been available for the BBC B for some time, but a Risc version is currently in the final stages of development. Like its Beeb counterpart, *Picture Builder* is intended for young children who are beginning to play and experiment with shapes. However, it is much faster and easier to use.

Although this is essentially a drawing package, pictures created can only be built from a set of basic shapes which can be rotated, enlarged, shrunk, stretched, squashed, reflected and coloured either in outline or as fills. These options offer endless possibilities and, being entirely mouse-driven from simple menus, present few problems for young children.

4Mation Educational Resources has plans well underway for some innovative software. *Craft Shop* will simulate a craft and design workshop, which in turn will stimulate children to produce 3D craft work. By using techniques such as quilling, curve stitching and embroidery, children can design their products on screen and have their finished art work printed out, used as templates or displayed in a disc-based 'craft shop'.

Artisan from Clares a comprehensive and versatile art program, has justifiably established itself in schools using Arc computers. It is far ahead of any art package on the model B, yet you can run much of the program without any recourse to the manual. Its features are quite breathtaking for those raised on older micros.

Artisan2 is a full Risc OS (windows) application with many additional features, including colour separations and textile design facilities. Perhaps its major attribute as far as schools are concerned is the ability to 'hide' features, thus making *Artisan2* more comprehensible to younger children.

Proartisan is an evolutionary development of *Artisan2*, adopting a more professional approach with both new and enhanced features. It offers an advanced image manipulation program, utilising 256 colours. One suggestion might be to use *Artisan2* as the introductory art program and to bring in *Proartisan* at a more advanced level, thus maintaining familiarity and ensuring a continuum in the development of skills and techniques.

Two new, 256-colour Archimedes art programs are *Art Nouveau* and *Atelier*.

Art Nouveau, written by teachers, is very pragmatic in its approach, possessing a wide range of useful features which are readily accessible. It's in the *Proartisan* class and is eminently suited to younger pupils who enjoy the ease with which they can achieve results and the speed at which familiarity (hence, confidence) grows.

Atelier offers features which bring gasps to those of us used to humble, BBC model B graphics. It has a vast array of sophisticated features and functions, both practical and esoteric, which can take some time to investigate and master. *Atelier* is an art program that will stretch your brightest computer artists, offering a graphic tool of the highest calibre.

For IT advisers or schools wishing to make art and design a focus for INSET, NCET has recently published two INSET packages. They are entitled *Art and Design Resource Pack* and *Design: Words and Images*. The former comprises five A4 booklets on various topics relating to art and design, plus an accompanying video tape. It addresses important issues relating to the introduction of information technology into the art room and offers useful, practical standalone INSET materials.

The latter comprises case studies, posters, photocopiable masters and software, and is literally brimming with ideas and suggestions. The software (which can be purchased separately) includes Concept Keyboard versions of *Picture Builder*, *Patterns* and *Cartoon* with colourful A4/A3 overlays and full instructions.

The experience of such notable authors as Derek Maxted and Mark Sealey are drawn upon and the content of the two accompanying booklets and reader will appeal as much to schools which want to foster DTP as those interested in fine art.

With any graphics package you use with children, try to divide the experience into three parts. First, demonstrate how certain essential things are achieved with the hardware and software provided (but be careful to leave some aspects open for discovery). Second, allow children time to play and experiment with the facilities on offer. When they have 'discovered' an interesting technique they will quite often be motivated to attempt a picture or design. Third, give them time to develop and amend their 'work of art'.

This is heavy on computer time but can be achieved in lunch hours or in sessions before school and is worth it for the tremendous pride and satisfaction gained. A well-executed screen can finally be dumped to the printer so that each child has a hard copy. For most pleasing results, an Integrex Colourjet printer is essential. However, don't underestimate the humble dot matrix printer: it can cut stencils, produce coloured spirit masters and even its normal output can be coloured in manually or used to form the basis for screen print stencils.

The Robin Light Pen *is available from Educational Software Company, 108 Parthenon Drive, Liverpool, L11 7AQ for the BBC B, Master 128. School price: £41.*

Picture Craft *is available from BBC Soft, PO Box 234, Wetherby, West Yorkshire LS23 7EU for the BBC B, B+, Master 128. School price: £19.95.*

Artisan2 *and* Proartisan *are available from Clares Micro Supplies, 98 Middlewich Road, Rudheath, Northwich, Cheshire, CW9 7DA. School price: £59.95 and £99.95 respectively.*

Art Nouveau *is available from Computer Assisted Learning Ltd, Strathclyde Business Centre, New Steventon, Strathclyde, ML1 4JB for the Archimedes series, and the A3000. School price: £42.50.*

Atelier *is available from Minerva Systems, 69 Sidwell Street, Exeter, EX4 6PH for the Archimedes A310, A400 series, A3000. School price: £99.*

Art and Design Resource Pack *and* Design: Words and Images *are available from MESU Publications, Hoddle, Doyle and Meadows Ltd, Old Mead Road, Elsenham, Bishops Stortford, Herts, CM22 6JN for the BBC B, Master 128. School prices: £35 and £50 (£12.50 for the software pack alone) respectively.*

ILLUSTRATION BY CHILDREN FROM THE RYDE SCHOOL, HATFIELD

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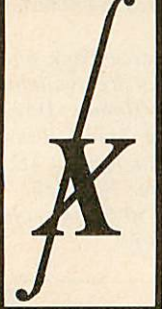
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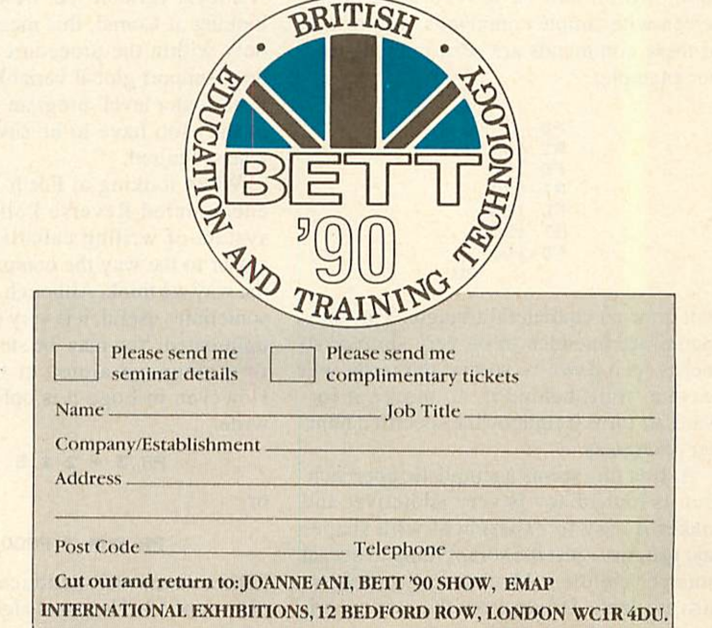
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RACING AHEAD WITH

Having spent a couple of months looking at hard 'professional' languages such as C and Forth, we return this month to the educational field.

Logo was developed to allow children to learn about computers without first having to master the principles on which the computer works. If you think about it, this is necessary even for a simple language such as Basic. You have to know that the program is stored as a number of consecutive statements; that you must enter all the steps first and then type RUN to make things happen, and so on. In particular, graphics require some calculation before anything can be made to happen – and in the case of the BBC micro, you may need to struggle with PLOT and GCOL codes.

Now it is true that these complications are unavoidable if you want to use the more sophisticated graphics commands; but even simple line drawings, such as triangles, require this approach.

On entering Logo, you are immediately able to draw simple graphics by means of a device known as a turtle. This is really a 'pen' which can be moved around the screen with simple commands. The results of these commands are seen immediately. For example:

```
PD
RT 60
FD 100
RT 120
FD 100
RT 120
FD 100
PU
```

will draw an equilateral triangle. The commands are intended to be very simple: PD means 'pen down' – so that the turtle will leave a 'trail' behind it. FD moves it forward, RT turns it right by the specified number of degrees.

At first this seems a simplistic approach. But its immediacy is very addictive, and makes it easy to experiment with shapes and patterns – just the sort of thing to attract younger children. Mechanical turtles are also available. Driven from the user or serial port of the micro, they can move around the floor in the same way, teaching children the basics of robot control. But the turtle is by no means all that Logo has to offer.

Like Forth, which we looked at last month, Logo supports procedures as a collection of 'words', rather than as part of a larger program, encouraging a 'modular' approach to programming. Here's an example of a procedure in Logo:

```
TO SQUARE :SIZE
REPEAT 4 [ FD :SIZE R
T 90 ]
END
```

The word SQUARE may now be used as, for example:

```
SQUARE 100
```

The form of the procedure is similar to Forth in that it is made up of words already defined. It is a little less obscure in syntax, though, the presence of REPEAT with the [and] as block markers making it more like Pascal or C. Individual procedures may also be saved and loaded, whereas Forth works only with complete vocabularies.

The parameter SIZE in the example above is a local variable. As we discussed when looking at Comal, this means that it exists only within the procedure SQUARE. Logo does support global variables, but as there is no 'outer level' program for them to live in they too have to be saved and loaded when required.

When looking at Forth last month, we encountered Reverse Polish Notation, a system of writing calculations which is closer to the way the computer works than the way we think. Although this approach is sometimes useful, it is very confusing to the uninitiated. You may be surprised to find it in a language aimed at the classroom. However, in Logo it is optional. You may write:

```
PR 3 + 2 * 5
```

or

```
PR SUM 3 PROD 2 5
```

Either form will produce the expected answer of 13. The usual algebraic signs are used for conventional notation, with SUM, PROD (product) and QUOT (quotient) used for addition/subtraction, multiplication and division in Reverse Polish.

Logo is not strong on 'structure' in the manner of languages like Pascal. There is no WHILE or CASE, and the REPEAT statement, as we saw above, acts more like Basic's FOR, but is less versatile. There is an IF structure, but the THEN and ELSE are implied rather than written, making decisions difficult to follow, for example:

```
IF :SIZE > 100 [BIG]
[SMALL]
```

instead of Basic's

```
IF SIZE > 100 THEN PR
OCbig ELSE PROCsmall
```

In spite of its structural weaknesses, Logo has something not available in some more advanced languages – the ability to handle lists of data. This is easier to show than to describe, so here are some examples:

```
[ THIS IS A LIST ]
[ THIS LIST [ CONTAIN
S ANOTHER LIST ] ]

MAKE "BOYCOTT
[ [ not out ] [ 100 ] ]

MAKE "SCORE [ [LIV
ERPOOL] [1] [ARSENAL]
[0] ]
```

Logo provides special functions for accessing elements of a list. For example:

```
MAKE "GOWER [ [ lbw b
ALDERMAN ] [ 50 ] ]
```

creates a list called GOWER. We can write a function HOWOUT:

```
TO HOWOUT :MAN
PR (SE [This man was
] FIRST :MAN [ for ]
LAST :MAN)
END
```

so that typing:

```
HOWOUT :GOWER
```

would give:

```
This man was lbw b ALDERMAN for 50
```

This is because the built-in functions FIRST

ILLUSTRATION BY MICKY FINN

LOGO

Continuing his indepth look at the languages currently available for your micro, **NEIL SYKES** returns to the classroom and reports on how Logo compares



and LAST extract the first and last elements from a list. In this way you can build up quite useful databases. More complicated retrievals can be carried out using BL (all but last), BF (all but first), and ITEM (ITEM 3 :SCORE above is ARSENAL). As it stands, this is clumsy to use, but the fact that Logo procedures are 'self-contained' makes it easy to extend without a rewrite.

Logo certainly abandons some of the conventions of programming, but is still accessible at a very elementary level. It can therefore be said to have succeeded in its aim to open up the computer to young children or to those less inclined to the technical aspects of programming. Its flaw, I feel, is that it is not a language that can grow with you. Unlike Pascal or Basic, it is not really suited to 'working' applications.

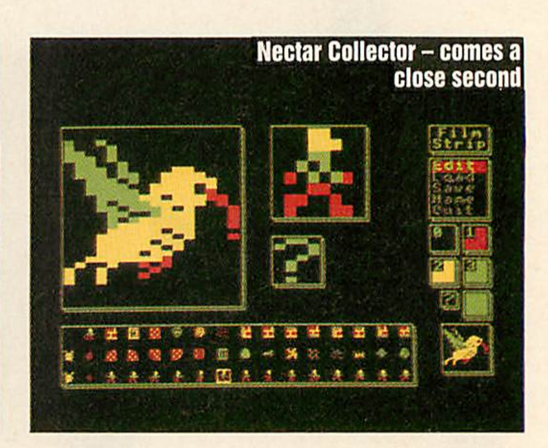
This may not matter to you, but it is debatable whether teaching children about computers is a means or an end. Logo relates to Basic much as the ZX81 does to the BBC micro: the Sinclair machine may well have introduced a lot of people to computing, but how many of those still use them? In contrast, the Beeb, like Basic, is primitive but leads much further.

Logo is available for the BBC micro in two versions (both as Roms): one, by Acorn, retails at £48, the other, by Logotron, costs £45. Logotron Logo comes with an extension disc with extra database procedures and utilities for controlling turtles. Logotron also produces an Arc version. It costs £63.

INFINITE

DAVID LAWRENCE finally lets us into the secret of programming your own exciting Repton Infinity

Ball – winner of the design a game competition



Nectar Collector – comes a close second

One of the most tricky parts of writing *Repton Infinity* was coming up with a specification for the *Repton* programming language – 'Reptol'. Initially we knew roughly what we wanted to be able to tell the compiler (in English) and near enough what we wanted it to produce (in 6502 code) but that was about it. The actual keywords, the syntax and facilities available evolved very slowly while writing the game.

The game evolved to such an extent that if we'd been presented with the final specification at the outset, I don't think the game would ever have been written!

Here, I'd like to discuss some of the more interesting features of Reptol, describe some of the problems involved in writing a game such as *Repton Infinity* and conclude by announcing the winners of Superior Software's 'design a game' competition.



Ball uses many extended features of Reptol and has eight screens

During development of the language, it was always quite amazing when the 'latest bit' finally started working. This is the sort of work that many games players never really seem to appreciate! The most memorable 'surprise' was when we suddenly realised that recursive definitions were possible, and it only took a few days of fiddling before the stackable magic walls appeared in *Repton 4* .

The four games supplied with *Repton Infinity* were written fairly early on in the development of the game and language, this was a shame in some respects as a few of the features that eventually found their way into the language were never actually illustrated in practice.

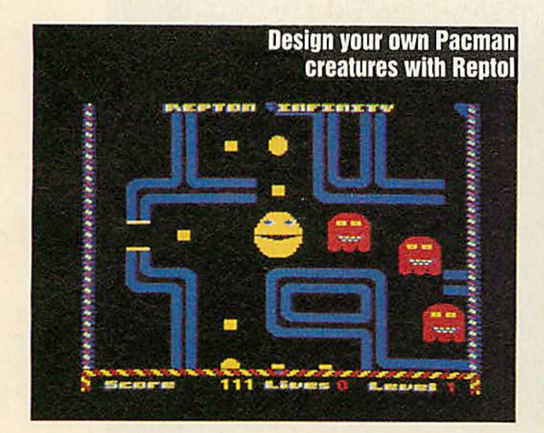
Among the more interesting features that did appear in *Repton 4*, *Robbo* and *Trakker* were the definable 'Action' key and being able to change the style of Repton's animation (with Cycle).

It is pleasing to note that many of the competition entries did actually make use of these more advanced facilities. Annoyingly, we quickly ran out of memory (and time!) before any of these ideas could be developed any further, who knows, perhaps there may yet be a *Repton Infinity 2*!

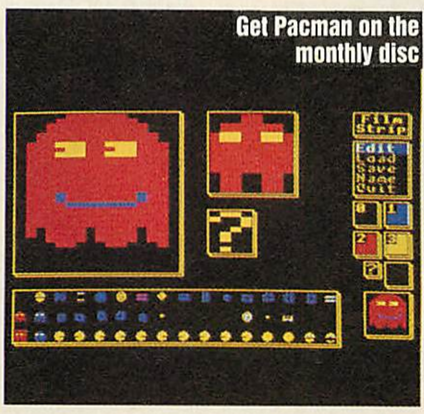
On the subject of memory usage, if you are planning to develop a large machine code program on the BBC micro, then please refer to Chris Ruseman's 'Druid Designer' in the August 1989 issue. There you will find a comprehensive table of what memory can and cannot be used when writing a game.

At one point, there was going to be a 'print' option on the Blue Print main menu but the only reason it didn't appear was because we were storing some rather vital information in the memory reserved for the printer buffer and couldn't move it any-

VARIATIONS

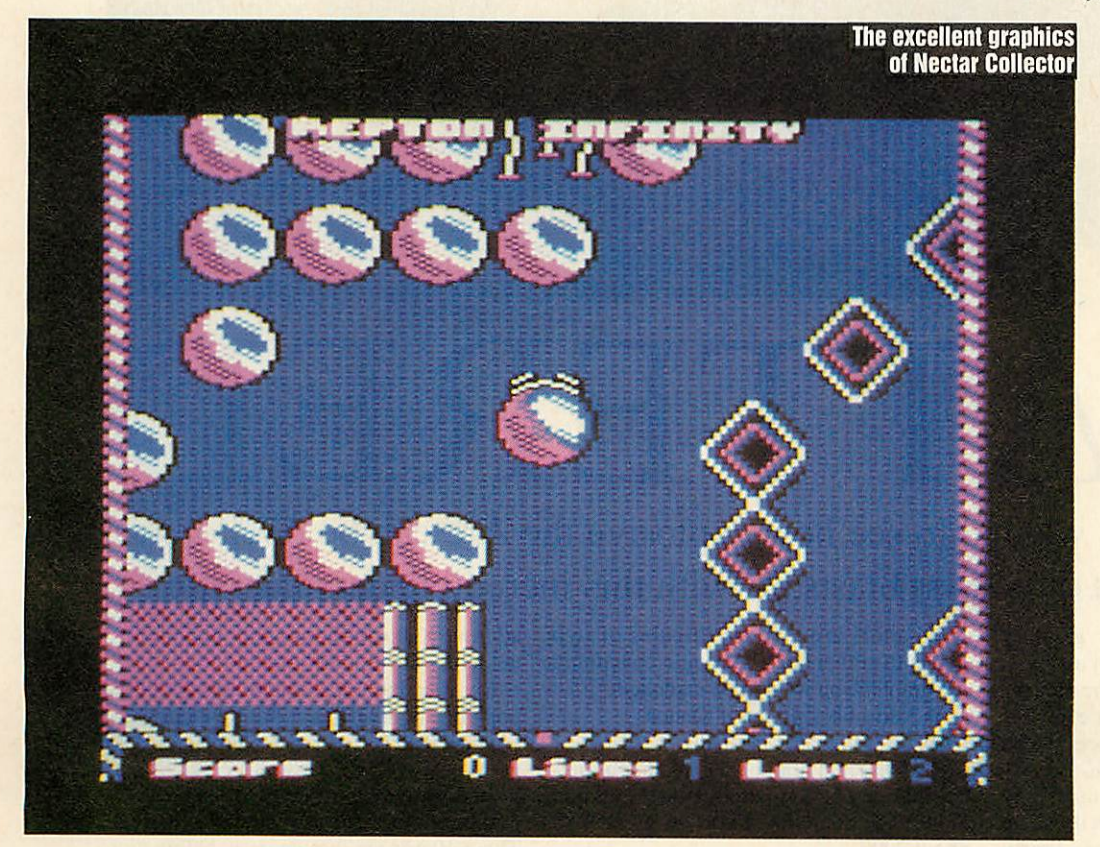


Design your own Pacman creatures with Reptol



Get Pacman on the monthly disc

games, and announces the deserving winners of Superior Software's 'Design a Game' competition



The excellent graphics of Nectar Collector

where else! So for everyone who has ever wanted to print out a Reptol file, I have written a standalone utility to do just that. On this month's program disc you will find 'BPLsrc'. Save and run this. It produces a file called 'BpList'. 'T.' files can then be printed by using *BpList :

>*BpList T.Rep3

If you want a hard copy of the output, use CTRL-B and CTRL-C in the usual way.

If you examine a 'T.' file using any other method (*DUMP or *TYPE), you will notice that only a small part of the file is human-readable, the rest contains values outside the printable Ascii range, in much the same way as a Basic program does.

'BpList' works by decoding these 'tokenised' values and printing the usual Reptol keyword, it also expands the characters that represent indentation.

The only things that are not tokenised are numbers, closed brackets and user and system flags. So, if you start getting the 'No Room' error, try shortening the names of your user flags.

The reason for all this palaver, is again, lack of memory! Thus, the Reptol files are tokenised, and the output 6502 code is squashed with an optimiser. The latter probably being the most cunning piece of code in the whole game!

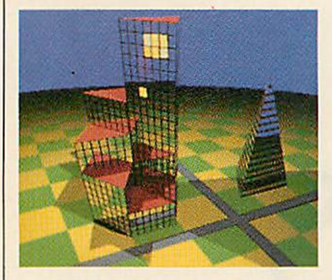
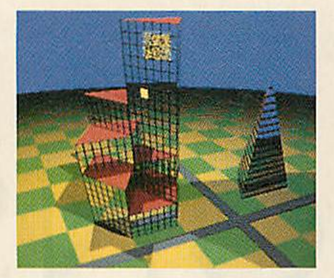
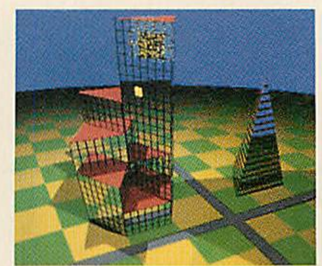
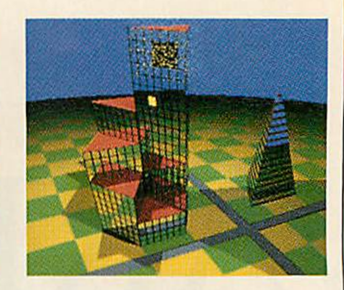
Although the competition is now over, Superior Software and *BAU* would still be interested in seeing any games written for *Repton Infinity*.

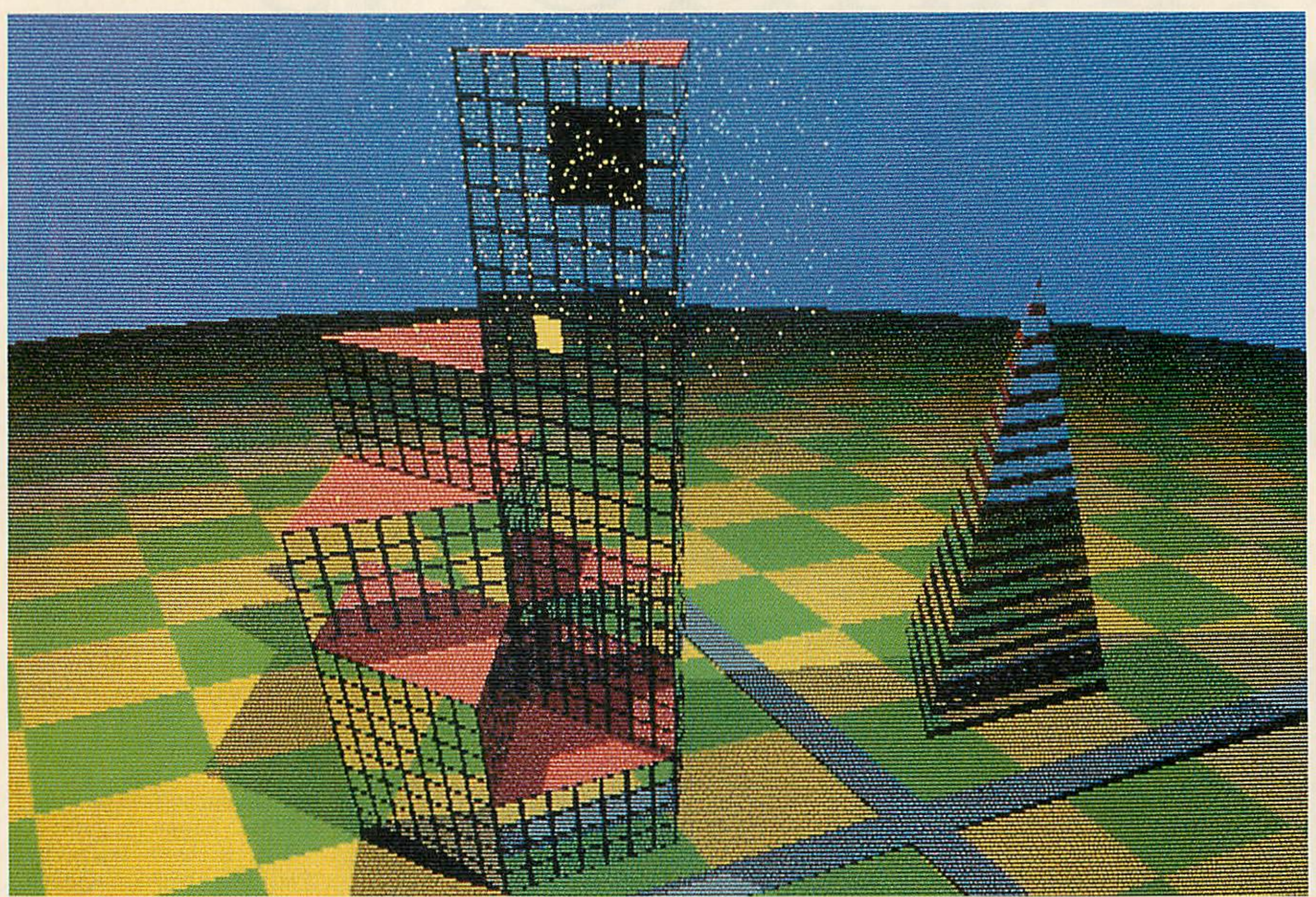
Finally, I would like to announce the winners of Superior's 'design a game' competition. The overall winner is Magnus Butlin with Alex Card as runner up. Also 'highly commended' were: Neil Banfield, David Cheng, Richard Clark, Marc Emmerson, Steven Gainham, T Gidden, Joseph Haig, Steven Hale, Richard Jeffs, Ben Phillips, Nicky Redman, Andrew Smith, Simon Stead and Steven Turner.

Magnus has produced a very intricate game (currently called 'Ball'), using many of the extended features of the language and has even designed a complete set of eight screens to accompany the game. For these reasons, he wins first prize and should see the game appear on *Play it again Sam 12* scheduled for a Christmas launch. Alex Card's 'Nectar Collector' receives the rather ambiguous 'runner up' label even though there is no actual second prize! This is because the graphics in the game are of a very high standard and really deserve a mention in their own right.

Due to copright problems, it is not possible to print any of the winning entries in the magazine, however you will find the definitions for Steven Shipway's *Pacman* clone, that accompanied his review in the July 1989 issue on the monthly disc.

To order your monthly disc, use the new order form on page 120.



SHATTERED

So, you've always wanted to see how explosive the Arc can be. Well now's your chance. **MICHAEL ATTENBOROUGH** blasts off with this incredible demonstration

If you've seen the Clares' graphics demonstration disc, you will remember the end of the 'mask' demo, in which the mask explodes into about 4000 little pieces which bounce around the screen.

This program enables you to make any piece of graphics explode in much the same way, each pixel moving independently under gravity and bouncing off the sides and bottom of the screen.

If the object has a low number of pixels, other things could be animated at the same time, so you could use the routine in your own games. Once PROCinit has been called, all you need to do is:

- Call PROCpickup(X1,Y1,X2,Y2) : the parameters are the co-ordinates of two opposite corners of a rectangle containing the graphic you want to be exploded.
- Add a background if needed.
- CALL animate repeatedly.

There is no real limit on the number of pixels that can be animated. It just gets too slow to be realistic if you do more than about 2000.

If you want to animate more, you will have to change the value of maxdots% in PROCinit, to set up a bigger array. The program pokes to screen memory (legally) for speed, so it only works in mode 15.

The program works with PROCpickup going over all the pixels in the rectangle you specify, and if non-black, the colour, address, X and Y co-ordinates and X and Y velocities are put into arrays.

My first attempt at this program had the positions and velocities stored as integers but then the pixels tended to group together periodically. I found that this could be prevented by storing 10 bits of fraction in the numbers and adding a random element. These 10 bits are thrown away before plotting by shifting the number to the right.

This 'fixed-point' method of storing fractions is an awful lot easier to implement than floating-point because, in this case, I am just storing the numbers multiplied by 1024. Adding and subtracting are done as usual but you must be careful if you intend to multiply.

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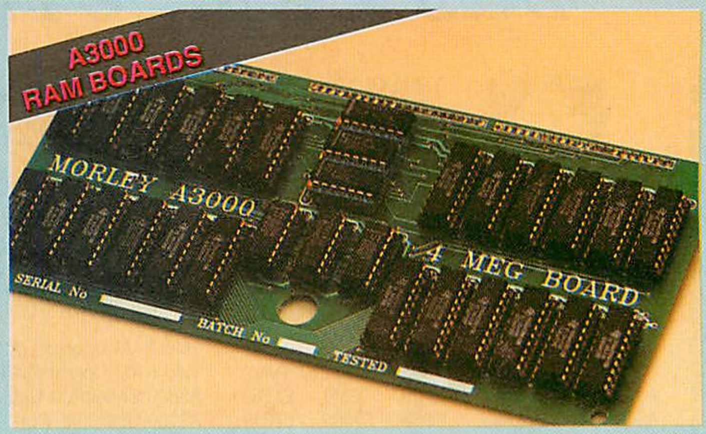
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We are now an Acorn dealer and service centre. If you would like to have a look at the A3000 or any other Acorn/Morley products please feel free to call in and discuss your requirements with our staff.

The Morley TELETEXT ADAPTER is now available for the Archimedes. The specification including screen dumps etc., is the same as the BBC version but connection is via a Podule socket.

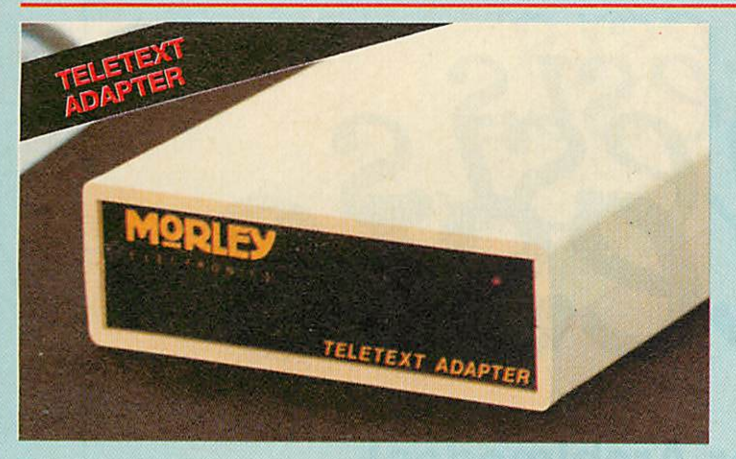
£125

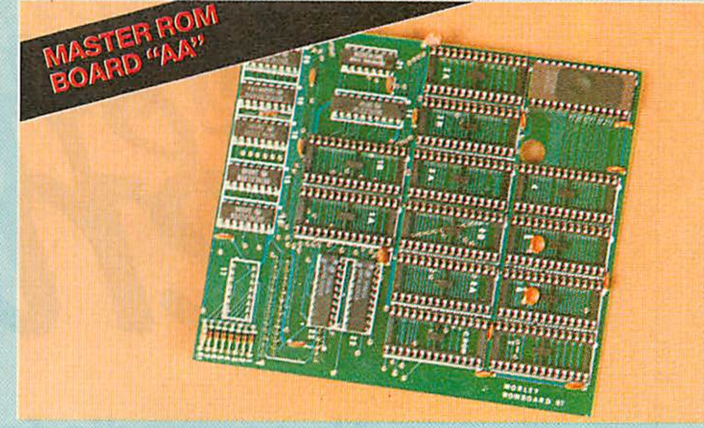
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MORLEY E·L·E·C·T·R·O·N·I·C·S







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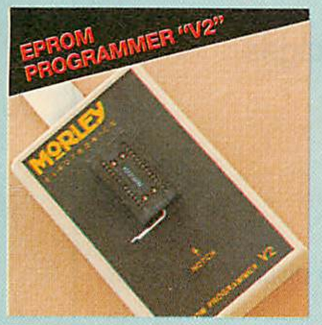
- State-of-the-art unit.
- ATS (Advanced Teletext Software) supplied on ROM.
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- Comprehensive user guide.
- Allows standard Teletext pages to be saved and printed.
- World's biggest selling adapter.

BBC/Master	£104
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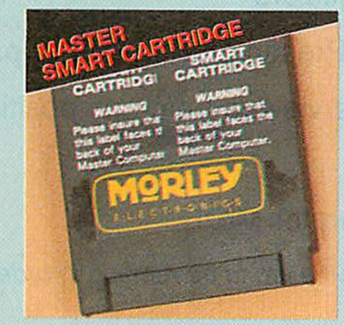
THE ULTIMATE ADD-ON FOR ALL SERIOUS MASTER USERS

- No more need to switch your computer off to insert a cartridge containing a required ROM.
- With 2 cartridges and a ROM board, a staggering 32 ROM images installed and accessible at any time.
- Allows up to an additional 8x16k and 4x32k ROMS installed inside your computer still leaving your cartridge slots free.
- Master control ROM which includes a clever file transfer program allowing files to be transferred between DFS and ADFS formats or vice versa.

£40



- Attractive state-of-the-art unit.
- Totally software controlled. Eprom creator utility also available.

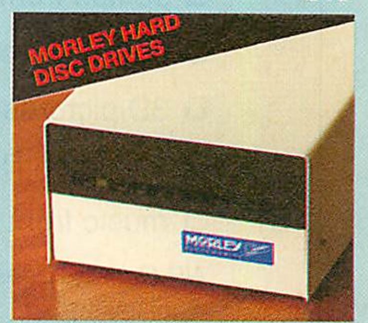


- Programmes 27128/2764/27256 Eproms: 12 and 21 volt.
- Includes full ROM management software with numerous features.

£30

- Fast to install and operate.
- User-friendly menu driven software.
- Built-in features include:
  - Autosaves computer's entire memory.
  - Freeze program at any point.
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  - Allows most protected software to be backed up including disc to tape and tape to disc.
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SOFTWARE ... SOFTWARE ... SOFTWARE ...

M/B SOFTWARE

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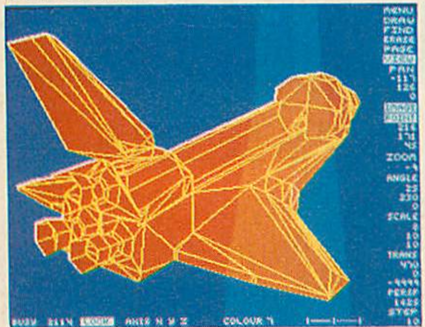
TO ORDER...

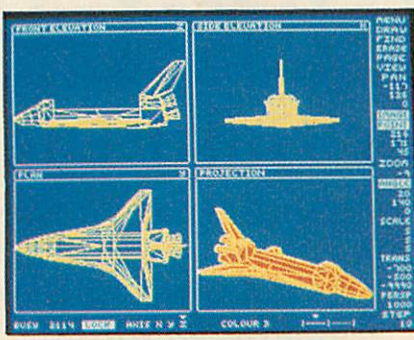
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SILICON VISION
SOFTWARE FOR THE ARCHIMEDES & BBC

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The ultimate 3D Draughting System for Architectural design, Interior design, Engineering Design and Teaching CDT. Allows drawing in plan, front & side elevations and also directly in 3D view. Includes powerful zoom & pan options for precision draughting and surface definition for creating solid colour objects. Also includes Sweep, Extrude & Macro facilities for designing very complex objects easily. Designs created with SolidCAD are compatible with the Realtime Graphics Language for high-speed flicker-free animation. The custom Archimedes version also performs smooth shading for realism. SolidCAD(Arc) users can upgrade to the Realtime Solids Modeller (Arc) for £40.00.

£49.95 (ARC or BBC B/B+/Master), New

REALTIME SOLIDS MODELLER

The package includes both the sophisticated design environment of SolidCAD and the high speed animation capability of a Realtime Graphics Language (RGL) module developed in pure ARM Risc code for supercharged performance. The package is ideal for Architectural design, Interior design, Engineering design & teaching CDT. The RGL module can be used to create standalone flicker-free animation of designs from your own programs. Smooth shading is also performed for realistic images. Through our in-house expertise in 3D Design and High-speed techniques, no other package can rival the design environment & animation speed of the Realtime Solids Modeller.

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The ultimate printer driver which takes advantage of the highest resolution capability of ordinary Epson compatible printers to provide 1920×1024 resolution. Images can also be scaled, positioned and previewed before printing. Fully compatible with SolidCAD, Realtime Graphics Language, Gate-Array design system & 3D CAD/Animation system. Your own graphics programs or other CAD packages can be made compatible with Super-Dump by the addition of a few simple commands. An example program is included in the package.

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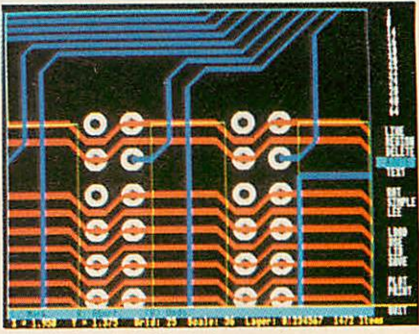
All Archimedes software run in native mode on A305 – A440 & A3000 with Arthur 1.2 or RISC OS

SILICON VISION LTD, SIGNAL HOUSE, LYON ROAD, HARROW MIDDLESEX HA1 2AG. TEL: 01-422 2274 or 01-861 2173 FAX: 01-427 5169. TELEX: 918266 SIGNAL G.

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ARC-PCB



The ultimate PCB design system developed specifically for the Archimedes with a specification that cannot be matched. Includes Automatic routing, Rats-nesting, 8 layers, Surface mount capability, 0.001" resolution, 32"×32" maximum board size, On-line Help, Fast Zoom/Pan/Redraw, Text & Silkscreen facility, Variable Line/Pad/Text/Grid sizes, Part Libraries, Block Move/Copy/Rotate/Mirror/Erase options, and up to 300,000 components.
For hardcopy, the system supports the industry standard HP-GL, GRAPHTEC, PLOTMATE plotters and printers at their highest resolutions. Also provides automatic drilling information with extensive support from PCB manufacturers for final layout and production, optional 1 year telephone Hotline support (£100) and software maintenance service (£75) is also available.

£195.00 (ARC) New

Risc BASIC

The first true BASIC V syntax compiler which will convert your programs into supercharged Risc code for turbo performance leaving the competition standing. Features include Relocatable modules, full cross references, Double precision floating point & Integer support, in-line assembly, Window-based or command line compilation environment, standalone code generator, object code optimiser, full array manipulation and dimensions support, multiple exit structures & full runtime error handler.

£99.95 (ARC) New

RiscFORTH

A new 32-bit implementation of the FORTH-83 standard, designed to take full advantage of the ARM architecture. Features include Multi-tasking, Optimising compiler, built-in ARM assembler with floating point mnemonics, built-in Full screen Editor, File system interface, OS calls support, Floating point & Integer maths, WIMP support, Single-step debugger, Shadow screen for documentation, Block manipulation, Dictionary & Vocabulary display, Call finding and a standalone code generator.

£99.95 (ARC) New

COMPATIBILITY

Program	Page	BBC B	B+/128	Master 128	Master Compact	Electron	Arc	6502SP/ Turbo	ADFS	Econet	Shadow RAM	Monthly Disc
Eight Bits	33											
Listing 1		■	■	■	■			■	■	■	■	■
Listing 2		■	■	■	■	■		■	■	■	■	■
Listing 3		■	■	■	■	■	■	■	■	■	■	■
Risc Revue	30											
Listing 1-2							■		■	■	■	■
Listings 3-4		■	■	■	■	■	■	■	■	■	■	■
Listing 5							■		■	■	■	■
Diary	71											
Listing 1		■(1)	■	■	■		■	■	■	■	■	■
Word Games	75											
Listings 1-4		■	■	■	■			■	■	■	■	■
Listings 5-7							■		■	■	■	■
Listing 8		■	■	■	■	■	■	■	■	■	■	■
Listings 9-10							■		■	■	■	■
Explode	90											
Listing 1							■		■	■	■	■

Note. 1. may require shadow RAM with Model B

EIGHT BITS

Listing 1

```
   10 REM Scrolling creator
   20 REM by Graham Hammell
   30 REM for B/B+/M/C
   40 REM (c) BAU Jan 9Ø
   5Ø :
   6Ø MODE 7
   7Ø HIMEM=TOP+2ØØØ
   8Ø PROCinit
   9Ø PROCass
  1ØØ PROCsave
  11Ø END
  12Ø :
  13Ø DEF PROCinit
  14Ø CLS
  15Ø PRINT"Please enter the text colour
."
  16Ø PRINT"1 - Red  2 - Green  3 - Yell
ow"
  17Ø PRINT"4 - Blue 5 - Purple 6 - Cyan
"
  18Ø PRINT"7 - White"
  19Ø INPUT "Colour :" C%
  2ØØ IF C%<1 OR C%>7 THEN 19Ø
  21Ø INPUT'"X start co-ordinates (2-38)
:" X%
  22Ø IF X%<2 OR X%>38 THEN 21Ø
  23Ø INPUT'"Y start co-ordinates (Ø-23)
:" Y%
  24Ø IF Y%<Ø OR Y%>23 THEN 23Ø
  25Ø PRINT'"Length of scroll (2-";39-X%
;") :";
  26Ø INPUT""L%
  27Ø IF L%<2 OR L%>(39-X%) THEN 25Ø
  28Ø INPUT'"Speed 1-Fast 5Ø-Slow :" S%
  29Ø IF S%<1 OR S%>5Ø THEN 28Ø
  3ØØ address=(&7CØØ+(Y%*4Ø+X%))
  31Ø address2=address+4Ø
  32Ø INPUT'"Enter text filename :"F$
  33Ø CH%=OPENIN(F$)
  34Ø E%=EXT# CH%
  35Ø CLOSE# CH%
  36Ø ad=&7CØØ-(E%+&89)
  37Ø ENDPROC
  38Ø :
  39Ø DEF PROCass
  4ØØ addr=&7Ø
  41Ø addr2=&72
  42Ø message=&74
  43Ø counter=&76
  44Ø osbyte=&FFF4
  45Ø FOR pass=Ø TO 2 STEP 2
  46Ø P%=ad
  47Ø [OPT pass
  48Ø LDA #141
  49Ø STA address-2
  5ØØ STA address2-2
  51Ø LDA #C%+128
  52Ø STA address-1
  53Ø STA address2-1
  54Ø LDA #text MOD 256
  55Ø STA message
  56Ø LDA #text DIV 256
  57Ø STA message+1
  58Ø LDA #start MOD 256
  59Ø STA &22Ø
  6ØØ LDA #start DIV 256
  61Ø STA &221
  62Ø LDA #Ø
  63Ø STA counter
  64Ø LDA #14
  65Ø LDX #4
  66Ø JSR osbyte
  67Ø RTS
  68Ø .start
  69Ø PHP
  7ØØ PHA
  71Ø TXA
  72Ø PHA
  73Ø TYA
  74Ø PHA
  75Ø INC counter
  76Ø LDA counter
  77Ø CMP #S%
  78Ø BEQ ok
  79Ø JMP end
  8ØØ .ok
  81Ø LDA #Ø
  82Ø STA counter
  83Ø LDA #address MOD 256
  84Ø STA addr
  85Ø LDA #address DIV 256
  86Ø STA addr+1
  87Ø LDA #address2 MOD 256
  88Ø STA addr2
  89Ø LDA #address2 DIV 256
  9ØØ STA addr2+1
  91Ø LDY #1
  92Ø .loop
  93Ø LDA (addr),Y
  94Ø DEY
  95Ø STA (addr),Y
  96Ø STA (addr2),Y
  97Ø INY
  98Ø INY
  99Ø CPY #L%+1
 1ØØØ BNE loop
 1Ø1Ø LDA (message)
 1Ø2Ø CMP #Ø
 1Ø3Ø BNE skip
 1Ø4Ø LDA #text MOD 256
 1Ø5Ø STA message
 1Ø6Ø LDA #text DIV 256
 1Ø7Ø STA message+1
 1Ø8Ø LDA (message)
 1Ø9Ø .skip
 11ØØ LDY #L%
 111Ø STA (addr),Y
 112Ø STA (addr2),Y
 113Ø INC message
 114Ø LDA message
 115Ø CMP #Ø
 116Ø BNE end
 117Ø INC message+1
 118Ø .end
 119Ø PLA
 12ØØ TAY
 121Ø PLA
 122Ø TAX
 123Ø PLA
 124Ø PLP
 125Ø RTS
 126Ø .text
 127Ø ]
 128Ø NEXT
 129Ø ENDPROC
 13ØØ :
 131Ø DEF PROCsave
 132Ø CLS
 133Ø INPUT"Enter filename to save as :"
fil$
 134Ø OSCLI("LOAD "+F$+" "+STR$~text)
 135Ø ?&7BFF=Ø
 136Ø OSCLI("SAVE "+fil$+" "+STR$~ad+" 7
CØØ "+STR$~ad+" "+STR$~ad)
 137Ø PRINT'"Set HIMEM to &";~(ad-(ad MO
D 256))
 138Ø ENDPROC
>■
```

Listing 2

```
   1Ø REM Size a directory
   2Ø REM by Joe Abley
   3Ø REM for B/B+/E/M/C
   4Ø REM (c) BAU Jan 9Ø
   5Ø :
   6Ø DIM code% &2ØØ
   7Ø :
   8Ø osgbpb = &FFD1
   9Ø osfile = &FFDD
  1ØØ oswrch = &FFEE
  11Ø osnewl = &FFE7
  12Ø osargs = &FFDA
  13Ø oscli  = &FFF7
  14Ø :
  15Ø FOR pass=4 TO 6 STEP 2
  16Ø O%=code%
  17Ø P%=&9ØØ
  18Ø [OPT pass
  19Ø :
  2ØØ .entry
  21Ø LDY #Ø
  22Ø LDA #1
  23Ø LDX #&A8
  24Ø JSR osargs
  25Ø LDY #Ø
  26Ø LDX #Ø
  27Ø .dirto
  28Ø LDA (&A8),Y
  29Ø CMP #32
  3ØØ BEQ noin
  31Ø STA data,X
  32Ø INX
  33Ø .noin
  34Ø INY
  35Ø CMP #13
  36Ø BNE dirto
  37Ø LDA data
  38Ø CMP #13
  39Ø BEQ main
  4ØØ LDX #dir MOD &1ØØ
  41Ø LDY #dir DIV &1ØØ
  42Ø JSR oscli
  43Ø .main
  44Ø JSR size
  45Ø JSR osnewl
  46Ø LDX #Ø
  47Ø .ins1
  48Ø LDA ftext,X
  49Ø JSR oswrch
  5ØØ INX
  51Ø CPX #7
  52Ø BNE ins1
  53Ø LDA files+1
  54Ø JSR hex
  55Ø LDA files
  56Ø JSR hex
  57Ø JSR osnewl
  58Ø LDX #Ø
  59Ø .ins2
  6ØØ LDA dtext,X
  61Ø JSR oswrch
  62Ø INX
  63Ø CPX #7
  64Ø BNE ins2
  65Ø LDA dirs+1
  66Ø JSR hex
  67Ø LDA dirs
  68Ø JSR hex
  69Ø JMP osnewl
  7ØØ :
  71Ø .size
  72Ø LDX #12
  73Ø .moved
  74Ø LDA oldblk,X
  75Ø STA newblk,X
  76Ø DEX
  77Ø BPL moved
  78Ø LDX #newblk MOD &1ØØ
  79Ø LDY #newblk DIV &1ØØ
  8ØØ LDA #8
  81Ø JSR osgbpb
  82Ø LDA newblk+5
  83Ø BEQ continue
  84Ø .disp
  85Ø LDX #Ø
  86Ø .print
  87Ø LDA text,X
  88Ø JSR oswrch
  89Ø INX
  9ØØ CMP #ASC"&"
  91Ø BNE print
  92Ø LDX #3
  93Ø .amount
  94Ø LDA space,X
  95Ø JSR hex
  96Ø DEX
  97Ø BPL amount
  98Ø LDA #13
  99Ø JSR oswrch
 1ØØØ RTS
```

Continued ▶

EIGHT BITS

◀ Continued

```
1010 :
1020 .continue
1030 LDX data
1040 LDA #&D
1050 STA data+1,X
1060 LDX #fileb MOD &100
1070 LDY #fileb DIV &100
1080 LDA #5
1090 JSR osfile
1100 CMP #2
1110 BEQ directory
1120 LDX #0
1130 JSR bcdinc
1140 LDA fileb+10
1150 CLC
1160 ADC #&FF
1170 STZ fileb+10
1180 LDX #11
1190 .inc
1200 LDA fileb,X
1210 ADC #0
1220 STA fileb,X
1230 INX
1240 CPX #14
1250 BNE inc
1260 INC seq
1270 BNE noinc
1280 INC seq+1
1290 .noinc
1300 JSR addon
1310 JMP size
1320 :
1330 .directory
1340 LDX #2
1350 JSR bcdinc
1360 JSR addon
1370 LDA seq+1
1380 PHA
1390 LDA seq
1400 PHA
1410 LDA #32
1420 STA data
1430 LDX #dir MOD &100
1440 LDY #dir DIV &100
1450 JSR oscli
1460 STZ seq
1470 STZ seq+1
1480 JSR size
1490 PLA
1500 CLC
1510 ADC #1
1520 STA seq
1530 PLA
1540 ADC #0
1550 STA seq+1
1560 LDX #up MOD &100
1570 LDY #up DIV &100
1580 JSR oscli
1590 JMP size
1600 :
1610 .addon
1620 LDX #0
1630 CLC
1640 PHP
1650 .add
1660 PLP
1670 LDA fileb+10,X
1680 ADC space,X
1690 STA space,X
1700 PHP
1710 INX
1720 CPX #4
1730 BNE add
1740 PLP
1750 RTS
1760 :
1770 .hex
1780 PHA
1790 LSR A
1800 LSR A
1810 LSR A
1820 LSR A
1830 JSR digit
1840 PLA
1850 .digit
1860 AND #&F
1870 CLC
1880 SED
1890 ADC #&90
1900 ADC #&40
1910 CLD
1920 JMP oswrch
1930 :
1940 .bcdinc
1950 LDA files,X
1960 SED
1970 CLC
1980 ADC #1
1990 STA files,X
2000 LDA files+1,X
2010 ADC #0
2020 STA files+1,X
2030 CLD
2040 RTS
2050 :
2060 .ftext
2070 EQUS "Files: "
2080 .dtext
2090 EQUS " Dirs: "
2100 .files
2110 EQUW 0
2120 .dirs
2130 EQUW 0
2140 .text
2150 EQUS "Bytes used: &"
2160 .newblk
2170 EQUB 0
2180 EQUD 0
2190 EQUD 0
2200 EQUD 0
2210 .oldblk
2220 EQUB 0
2230 EQUD data
2240 EQUD 1
2250 .seq
2260 EQUD 0
2270 .fileb
2280 EQUW data+1
2290 EQUD 0
2300 EQUD 0
2310 EQUD 0
2320 EQUD 0
2330 .space
2340 EQUD 0
2350 .up
2360 EQUS "DIR ^"
2370 EQUB 13
2380 .dir
2390 EQUS "DIR "
2400 .data
2410 ]NEXT
2420 :
2430 DIM X% &100
2440 Y%=X% DIV &100
2450 $X%="SAVE SIZE "+STR$~code%+" "+ST
R$~O%+" FFFF0900 FFFF0900"
2460 CALL &FFF7
```

Listing 3

```
10 REM Universal Menu System
20 REM By Michael Isherwood
30 REM for B/B+/E/M/C/A
40 REM (c) BAU January 1990
50 :
60 MODE 0
70 CLEAR
80 PROCinit
90 PROCmenulist
100 REPEAT
110 *FX 15
120 PROCmenuitem
130 PRINTTAB(0,20);
140 PRINT"You selected item ";Citem%;"
on Menu ";Cmenu%
150 PRINT"You selected option ";FNopti
on
160 UNTIL C%=5
170 END
180 :
190 DEF PROCinit
200 *FX 4,1
210 bcol%=0
220 fcol%=7
230 down%=3
240 Cmenu%=1:Citem%=1
250 READ Menu%
260 DIM Menuitems%(Menu%),Menu$(Menu%,
10)
270 FOR I%=1 TO Menu%
280 READ Menuitems%(I%)
290 FOR J%=0 TO Menuitems%(I%)
300 READ Menu$(I%,J%)
310 NEXT
320 NEXT
330 cr$=CHR$13
340 cur$=CHR$&88+CHR$&89+CHR$&8A+CHR$&
8B
350 VDU 23,225,8,8,8,8,8,8,8,8
360 VDU 23,226,8,8,8,8,8,8,8,&F
370 VDU 23,227,&F,8,8,8,8,8,8,8
380 VDU 23,228,8,8,8,8,8,8,8,&F8
390 VDU 23,229,&F8,8,8,8,8,8,8,8
400 VDU 23,230,&FF,0,0,0,0,0,0,0
410 VDU 23,1,0;0;0;0;
420 ENDPROC
430 :
440 DEF PROCmenulist
450 PRINT:PRINT" ";
460 FOR I%=1 TO Menu%
470 PRINT Menu$(I%,0);SPC3;
480 NEXT
490 PROCbox(FNxpos(Cmenu%),3,FNmenuwid
th+2,(Menuitems%(Cmenu%)+2))
500 FOR Z%=1 TO Menuitems%(Cmenu%)
510 PROCshow(Menu$(Cmenu%,Z%),FNxpos(C
menu%),Z%+2,bcol%,fcol%)
520 NEXT
530 ENDPROC
540 :
550 DEF PROCmenuitem
560 PROCshow(Menu$(Cmenu%,Citem%),FNxp
os(Cmenu%),down%,fcol%,bcol%)
570 C%=FNin(cur$+cr$)
580 PROCshow(Menu$(Cmenu%,Citem%),FNxp
os(Cmenu%),down%,bcol%,fcol%)
590 IF C%<5 PROCmove
600 IF C%=1 OR C%=2 CLS:PROCmenulist
610 ENDPROC
620 :
630 DEF PROCcol(C%,D%)
640 COLOUR C%
650 COLOUR 128+D%
660 ENDPROC
670 :
680 DEF FNin(k$)
690 REPEAT
700 I%=INSTR(k$,GET$)
710 VDU -7*(I%=0)
720 UNTIL I%<>0
730 =I%
740 :
750 DEF PROCshow(N$,X%,Y%,B%,F%)
760 PROCcol(F%,B%)
770 PRINTTAB(X%,Y%);N$
780 PROCcol(fcol%,bcol%)
790 ENDPROC
800 :
810 DEF PROCmove
820 IF C%=1 THEN Cmenu%=Cmenu%-1
830 IF C%=2 THEN Cmenu%=Cmenu%+1
840 IF C%=3 THEN Citem%=Citem%+1:down%
=down%+1
850 IF C%=4 THEN Citem%=Citem%-1:down%
=down%-1
860 IF Cmenu%<1 THEN Cmenu%=1
870 IF Cmenu%>Menu% THEN Cmenu%=Menu%
880 IF down%<3 THEN down%=3
890 IF down%>(Menuitems%(Cmenu%)+2) TH
EN down%=(Menuitems%(Cmenu%)+2)
900 IF Citem%<1 THEN Citem%=1
910 IF Citem%>Menuitems%(Cmenu%) THEN
Citem%=Menuitems%(Cmenu%)
920 ENDPROC
930 :
940 DEF FNxpos(M)
950 ac%=0
960 IF M=1 THEN =1
970 FOR I%=1 TO M-1
980 ac%=ac%+LEN(Menu$(I%,0))+3
990 NEXT
1000 =ac%+1
1010 :
1020 DEF PROCbox(X,Y,W,H)
1030 PRINTTAB(X-1,Y-1);
1040 P=POS
1050 PRINTCHR$227;
1060 PROCwidthloop(230)
1070 VDU 229,10,13
1080 FORJ%=1 TO H-2
1090 PRINTSPC(P);CHR$225;
1100 PROCwidthloop(9)
1110 PRINTCHR$225
1120 NEXT
1130 PRINTSPC(P);CHR$226;
1140 PROCwidthloop(95)
1150 VDU 228,10,13
1160 ENDPROC
1170 :
1180 DEF PROCwidthloop(Ch%)
1190 FOR I%=1 TO W-2
1200 VDU Ch%
1210 NEXT
1220 ENDPROC
1230 :
1240 DEF FNoption
1250 IF Cmenu%=1 THEN =Citem%
1260 Mopt=0
1270 FOR I%=1 TO Cmenu%-1
1280 Mopt=Mopt+Menuitems%(I%)
1290 NEXT
1300 =Mopt+Citem%
1310 :
1320 DEF FNmenuwidth
1330 hiwidth=0
1340 FOR I%=1 TO Menuitems%(Cmenu%)
1350 IF LEN(Menu$(Cmenu%,I%))>hiwidth T
HEN hiwidth=LEN(Menu$(Cmenu%,I%))
1360 NEXT
1370 =hiwidth
1380 :
1390 DATA 6
1400 DATA 3,File,Load,Save,Quit
1410 DATA 3,Maintain,Add,Delete,Change
1420 DATA 2,Retrieve,Code,Name
1430 DATA 1,Order,Place
1440 DATA 4,Print,List All Items,Order,
Record,Labels
1450 DATA 2,Analysis,Profit,Price
```

RISC REVUE

Listing 1

```
10 REM >!RunImage (Agora 1)
20 REM Solitaire
30 REM by David Andrews
40 REM for Archimedes only
50 REM (c) BAU January 1990
60 :
70 DIM block 2000,menu 1024
80 DIM board$(8,8),board_i 350,icon 1
0
90 ON ERROR PROCerror:GOTO 360
100 :
110 $block="TASK"
120 SYS "Wimp_Initialise",200,!block,"
Solitaire" TO ,task
130 :
140 $icon="!Solitaire"
150 block!0=-1:block!4=0
160 block!8=0:block!12=68
170 block!16=68
180 block!20=&B7002102
190 block!24=icon:block!28=1
200 block!32=LEN($icon)
210 SYS "Wimp_CreateIcon",,block TO so
litaire%
220 :
230 X%=OPENIN("<Solitaire$Dir>.sprites
")
240 T%=(EXT#X%)+16
250 CLOSE#X%
260 DIM sp% T%
270 sp%!0=T%:sp%!4=0
280 sp%!8=16:sp%!12=16
290 SYS "OS_SpriteOp",&10A,sp%,"<Solit
aire$Dir>.sprites"
300 board=FNwindow("Solitaire",&13,7,1
0,560,560,600,500,10000,10000)
310 open%=FALSE
320 PROCnew_board
330 menu%=FNdefine_menu("Solitaire,200
|New board,Quit",menu)
340 :
350 SYS "Wimp_DragBox",,-1
360 quit=FALSE
370 REPEAT
380 CASE FNreason(1) OF
390 WHEN 1:
400 WHEN 2:PROCopen_window(block!0,blo
ck)
410 WHEN 3:PROCclose_window(block!0)
420 WHEN 4:
430 WHEN 5:
440 WHEN 6:PROCmouse_button(block)
450 WHEN 7:PROCdrag
460 WHEN 8:
470 WHEN 9:PROCmenu_select(block)
480 ENDCASE
490 UNTIL quit
500 SYS "Wimp_CloseDown"
510 END
520 :
530 DEF FNreason(a%)
540 LOCAL reason
550 SYS "Wimp_Poll",a%,block TO reason
560 =reason
570 :
580 DEF PROCreceieve(b)
590 CASE b!16 OF
600 WHEN 0:quit=TRUE
610 ENDCASE
620 ENDPROC
630 :
640 DEF FNdefine_menu(m$,mb%)
```

Continued ▶


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```
 650 LOCAL title$,width%,tick,write,lin
e,shade,sub,flag,code$,p%,noi%,i$
 660 IF RIGHT$(m$,1)<>"," THEN m$+=","
 670 title$=LEFT$(m$,INSTR(m$,"|")-1)
 680 m$=MID$(m$,INSTR(m$,"|")+1)
 690 width%=EVAL(MID$(title$,INSTR(titl
e$,",")+1))
 700 title$=LEFT$(title$,INSTR(title$,"
,")-1)
 710 i$=m$
 720 noi%=Ø
 730 REPEAT
 740 IF LEFT$(i$,1)="[" i$=MID$(i$,INST
R(i$,"]")+1)
 750 noi%+=1
 760 i$=MID$(i$,INSTR(i$,",")+1)
 770 UNTIL i$=""
 780 next%=mb%+28+24*noi%
 790 $mb%=STRING$(12,CHR$(Ø))
 800 $mb%=LEFT$(title$,11)
 810 mb%?12=7:mb%?13=2
 820 mb%?14=7:mb%?15=Ø
 830 mb%!16=width%:mb%!2Ø=4Ø
 840 mb%!24=Ø:p%=mb%+28
 850 REPEAT
 860 tick=Ø:write=Ø:line=Ø:shade=Ø
 870 sub=-1:flag=&Ø7Ø1ØØ21
 880 IF LEFT$(m$,1)="[" THEN m$=MID$(m$
,2)
 890 code$=LEFT$(m$,INSTR(m$,"]")-1)
 900 m$=MID$(m$,INSTR(m$,"]")+1) ELSE c
ode$=""
 910 IF code$="ON" THEN tick=1
 920 IF code$="OFF" THEN tick=Ø
 930 IF code$="SHADE" THEN shade=1:code
$=""
 940 IF code$="NSHADE" THEN shade=Ø
 950 IF LEFT$(code$,1)="W" THEN write=1
 960 IF LEFT$(code$,1)="S" THEN
 970 code$=MID$(code$,3)
 980 sub=FNdefine_menu(EVAL(code$),next
%)
 990 ENDIF
 1000 IF LEFT$(m$,1)="-" THEN line=1:m$=
MID$(m$,2)
 1010 IF write THEN
 1020 code$=MID$(code$,3)
 1030 p%!12=EVAL(LEFT$(code$,INSTR(code$
,",")-1))
 1040 p%!16=-1
 1050 p%!2Ø=EVAL(MID$(code$,INSTR(code$,
",")+1))
 1060 m$=MID$(m$,INSTR(m$,",")+1)
 1070 ELSE
 1080 data$=LEFT$(m$,INSTR(m$,",")-1)
 1090 $(p%+12)=LEFT$(data$,11):m$=MID$(m
$,INSTR(m$,",")+1)
 1100 ENDIF
 1110 IF write THEN flag=flag OR &1ØØ
 1120 flag=flag OR (shade<<22)
 1130 p%!Ø=tick OR (line<<1) OR (write<<
2) OR (ABS(m$="")<<7)
 1140 p%!4=sub:p%!8=flag
 1150 p%+=24
 1160 UNTIL m$=""
 1170 =mb%
 1180 :
 1190 DEF FNwindow(title$,flags%,fgcol%,
bgcol%,maxx%,maxy%,wal%,wab%,war%,wat%)
 1200 LOCAL handle%
 1210 block!Ø=wal%:block!4=wab%
 1220 block!8=war%:block!12=wat%
 1230 block!16=Ø:block!2Ø=maxy%
 1240 block!24=-1:block!28=flags%
 1250 block?32=7:block?33=2
 1260 block?34=fgcol%:block?35=bgcol%
 1270 block?36=3:block?37=1
 1280 block?38=13:block?39=Ø
 1290 block!4Ø=Ø:block!44=Ø
 1300 block!48=maxx%:block!52=maxy%
 1310 block!56=&2D:block!6Ø=&3ØØØ
 1320 block!64=Ø:block!68=Ø
 1330 IF LEFT$(title$,1)="@" THEN
 1340 title$=MID$(title$,2)
 1350 block!56=&12D:block!72=EVAL(LEFT$(
title$,INSTR(title$,",")-1)):block!76=-1
:block!8Ø=EVAL(MID$(title$,INSTR(title$,
",")+1))
 1360 ELSE
 1370 $(block+72)=LEFT$(title$,11)
 1380 block!84=Ø
 1390 SYS "Wimp_CreateWindow",,block TO
handle%
 1400 =handle%
 1410 :
 1420 DEF PROCopen_menu(mb%,mx%,my%)
 1430 SYS "Wimp_CreateMenu",,mb%,mx%,my%
 1440 ENDPROC
 1450 :
 1460 DEF PROCopen_window(handle%,pos)
 1470 LOCAL b
 1480 IF pos=Ø THEN
 1490 b=block:b!Ø=handle%:SYS "Wimp_GetW
indowState",,b
 1500 ELSE
 1510 b=pos
 1520 ENDIF
 1530 SYS "Wimp_OpenWindow",,b
 1540 ENDPROC
 1550 :
 1560 DEF PROCclose_window(handle%)
 1570 IF handle%=board THEN open%=FALSE
 1580 block!Ø=handle%
 1590 SYS "Wimp_CloseWindow",,block
 1600 ENDPROC
 1610 :
 1620 DEF PROCmouse_button(block)
 1630 mousex%=block!Ø:mousey%=block!4:bu
ttons%=block!8
 1640 handle%=block!12:icon%=block!16
 1650 CASE handle% OF
 1660 WHEN -2
 1670 IF (buttons% AND 2) AND icon%=soli
taire% THEN PROCopen_menu(menu%,mousex%-
1ØØ,176)
 1680 IF (buttons% AND 4) AND icon%=soli
taire% THEN IF open%=FALSE THEN PROCopen
_window(board,FALSE):open%=TRUE
 1690 WHEN board
 1700 IF (buttons% AND 2) THEN
 1710 PROCopen_menu(menu%,mousex%-1ØØ,mo
usey%)
 1720 ELSE
 1730 IF buttons% AND 6 THEN
 1740 dragx%=mousex%:dragy%=mousey%
 1750 block!Ø=board:SYS "Wimp_GetWindowS
tate",,block
 1760 block!24=block!4
 1770 block!28=block!8
 1780 block!32=(block!12)+4Ø
 1790 block!36=(block!16)+4Ø
 1800 block!Ø=board:block!4=5
 1810 x%=(((mousex%-block!24)DIV 8Ø)*8Ø)
+block!24
 1820 y%=(((mousey%-block!28)DIV 8Ø)*8Ø)
+block!28
 1830 block!8=x%:block!12=y%
 1840 block!16=x%+8Ø:block!2Ø=y%+8Ø
 1850 SYS "Wimp_DragBox",,block
 1860 ENDIF
 1870 ENDIF
 1880 ENDCASE
 1890 ENDPROC
 1900 :
 1910 DEF PROCmenu_select(block)
 1920 CASE block!Ø OF
 1930 WHEN Ø:
 1940 IF open%=FALSE THEN PROCopen_windo
w(board,FALSE):open%=TRUE
 1950 PROCnew_board
 1960 SYS "Wimp_ForceRedraw",board,Ø,Ø,1
279,1Ø23
 1970 WHEN 1:
 1980 quit=TRUE
 1990 ENDCASE
 2000 ENDPROC
 2010 :
 2020 DEF PROCnew_board
 2030 RESTORE
 2040 FOR y%=1 TO 7
 2050 READ a$
 2060 FOR x%=1 TO 7
 2070 board$(x%,y%)=MID$(a$,x%,1)
 2080 NEXT
 2090 NEXT
 2100 PROCdraw_board
 2110 ENDPROC
 2120 :
 2130 DEF PROCdraw_board
 2140 FOR i%=1 TO 49:block!Ø=board:block
!4=i%-1:SYS "XWimp_DeleteIcon",,block:NE
XT
 2150 p%=board_i
 2160 FOR y%=1 TO 7
 2170 FOR x%=1 TO 7
 2180 icon$=""
 2190 CASE board$(x%,y%) OF
 2200 WHEN "Ø":icon$="ball"
 2210 WHEN "O":icon$="hollow"
 2220 ENDCASE
 2230 $p%=icon$
 2240 block!Ø=board:block!4=(x%-1)*8Ø
 2250 block!8=((8-y%)-1)*8Ø:block!12=x%*
8Ø
 2260 block!16=(8-y%)*8Ø:block!2Ø=&B7ØØ6
1Ø2
 2270 block!24=p%:block!28=sp%
 2280 block!32=LEN($p%)
 2290 IF icon$="" THEN block!2Ø=&B7ØØ6ØØ
1:block!24=13
 2300 SYS "Wimp_CreateIcon",,block
 2310 p%+=(LEN(icon$)+1)
 2320 NEXT
 2330 NEXT
 2340 ENDPROC
 2350 :
 2360 DEF PROCdrag
 2370 SYS "Wimp_GetPointerInfo",,block:x
%=block!Ø:y%=block!4
 2380 block!Ø=handle%:SYS "Wimp_GetWindo
wState",,block
 2390 x%=((x%-block!4)DIV 8Ø)+1
 2400 y%=7-((y%-block!8)DIV 8Ø)
 2410 dragx%=((dragx%-block!4)/8Ø)+1
 2420 dragy%=8-((dragy%-block!8)/8Ø)
 2430 IF board$(dragx%,dragy%)<>"Ø" THEN
VDU 7:ENDPROC
 2440 IF board$(x%,y%)<>"O" THEN VDU 7:E
NDPROC
 2450 difx%=dragx%-x%:dify%=dragy%-y%
 2460 IF difx% AND dify% THEN VDU 7:ENDP
ROC
 2470 IF difx% THEN IF difx%<>-2 AND dif
x%<>2 THEN VDU 7:ENDPROC
 2480 IF dify% THEN IF dify%<>-2 AND dif
y%<>2 THEN VDU 7:ENDPROC
 2490 CASE difx% OF
 2500 WHEN -2:midx%=dragx%+1
 2510 WHEN 2:midx%=dragx%-1
 2520 OTHERWISE midx%=dragx%
 2530 ENDCASE
 2540 CASE dify% OF
 2550 WHEN -2:midy%=dragy%+1
 2560 WHEN 2:midy%=dragy%-1
 2570 OTHERWISE midy%=dragy%
 2580 ENDCASE
 2590 IF board$(midx%,midy%)<>"Ø" THEN V
DU 7:ENDPROC
 2600 board$(dragx%,dragy%)="O"
 2610 board$(midx%,midy%)="O"
 2620 board$(x%,y%)="Ø"
 2630 PROCdraw_board
 2640 SYS "Wimp_ForceRedraw",board,Ø,Ø,1
279,1Ø23
 2650 ENDPROC
 2660 :
 2670 DEF PROCerror
 2680 SYS "Wimp_DragBox",,-1
 2690 !block=ERR
 2700 $(block+4)=REPORT$+" at line "+STR
$(ERL)+CHR$(Ø)
 2710 SYS "Wimp_ReportError",block,1,"So
litaire"
 2720 ENDPROC
 2730 :
 2740 DATA XXØØØXX,XXØØØXX,ØØØØØØØ,ØØØØ
ØØ,ØØØØØØØ,XXØØØXX,XXØØØXX
```

Listing 2

```
 10 REM >DataC (Agora 2)
 20 REM Solitaire data
 30 REM by David Andrews
 40 REM for Archimedes only
 50 REM (c) BAU January 199Ø
 60 :
 70 MODE 12
 80 INPUT "Enter root dir. (default $)
";d$
 90 IF d$="" THEN d$="$"
 100 OSCLI("Cdir "+d$+".!Solitaire")
 110 GCOL 1Ø
 120 RECTANGLE FILL Ø,Ø,8Ø,8Ø
 130 FOR n%=Ø TO 6 STEP 1
 140 GCOL 6-n%
 150 CIRCLE FILL 4Ø,4Ø,36-(n%*n%)
 160 NEXT
 170 GCOL 7
 180 CIRCLE 4Ø,4Ø,36
 190 MOVE Ø,Ø
 200 MOVE 79,79
 210 *SGet hollow
 220 GCOL 11
 230 CIRCLE FILL 4Ø,4Ø,29
 240 GCOL Ø
 250 LINE 24,56,28,56
 260 LINE 28,6Ø,32,6Ø
 270 LINE 32,56,36,56
 280 LINE 36,6Ø,4Ø,6Ø
 290 LINE 18,44,22,44
 300 LINE 2Ø,48,24,48
 310 LINE 26,44,3Ø,44
 320 LINE 28,48,32,48
 330 MOVE Ø,Ø
 340 MOVE 79,79
 350 *SGet ball
 360 OSCLI("SSave "+d$+".!Solitaire.Spr
ites")
 370 *SNEW
 380 :
 390 CLS
 400 GCOL 1
 410 RECTANGLE FILL Ø,Ø,67,67
 420 GCOL 14
 430 RECTANGLE FILL 19,Ø,25,67
 440 RECTANGLE FILL Ø,23,63,23
 450 GCOL 5
 460 FOR y%=Ø TO 2
 470 FOR x%=Ø TO 6
 480 MOVE x%*8+7,y%*8+27
 490 DRAW BY 4,Ø
 500 NEXT
 510 NEXT
 520 FOR y%=Ø TO 1
 530 FOR x%=Ø TO 2
 540 MOVE x%*8+23,y%*8+9
 550 DRAW BY 4,Ø
 560 MOVE x%*8+23,y%*8+49
 570 DRAW BY 4,Ø
 580 NEXT
 590 NEXT
 600 GCOL 11
 610 LINE 31,35,34,35
 620 GCOL 1
 630 POINT 19,Ø
 640 POINT 19,67
 650 POINT 45,Ø
 660 POINT 45,67
 670 POINT Ø,23
 680 POINT Ø,45
 690 POINT 63,23
 700 POINT 63,45
 710 MOVE Ø,Ø
 720 MOVE 67,67
 730 *SGet !Solitaire
 740 OSCLI("SSave "+d$+".!Solitaire.!Sp
rites")
 750 :
 760 f%=OPENOUT(d$+".!Solitaire.!Boot")
 770 BPUT#f%,"| !Boot file for Solitair
e - David Andrews 1989"
 780 BPUT#f%,"IconSprites <Obey$Dir>.!S
prites"
 790 CLOSE#f%
 800 :
 810 f%=OPENOUT(d$+".!Solitaire.!Run")
 820 BPUT#f%,"| !Run file for Solitaire
 - David Andrews 1989"
 830 BPUT#f%,"IconSprites <Obey$Dir>.!S
prites"
 840 BPUT#f%,"Set Solitaire$Dir <Obey$D
ir>"
 850 BPUT#f%,"WimpSlot -min 24K -max 24
K"
 860 BPUT#f%,"Run <Solitaire$Dir>.!RunI
mage"
 870 CLOSE#f%
 880 :
 890 OSCLI("SetType "+d$+".!Solitaire.!
Boot Obey")
 900 OSCLI("SetType "+d$+".!Solitaire.!
Run Obey")
 910 PRINT"Application directory comple
te"
 920 END
```

Listing 3

```
 10 REM >Perfect1 (Agora 3)
 20 REM Perfect numbers
 30 REM by David Smith
 40 REM for BBC B/B+/M/C/A
 50 REM (c) BAU January 199Ø
 60 :
 70 TIME=Ø
 80 FOR X%=1 TO 4
 90 READ A%
 100 B%=2^(A%-1)
 110 C%=2^A%-1
 120 IF (C% MOD 3=Ø AND C%<>3) OR (C% M
OD 5=Ø AND C%<>5) OR (C% MOD 7=Ø AND C%<
>7) OR (C% MOD 11=Ø AND C%<>11) THEN 14Ø
 130 PRINT B%*C%
 140 NEXT
 150 PRINT"Time=";TIME/1ØØ;" secs"
 160 END
 170 :
 180 DATA 2,3,5,7
```

Listing 4

```
 10 REM >Perfect2 (Agora 4)
 20 REM Perfect numbers
 30 REM by Andrew Pepperell
 40 REM for BBC B/B+/M/C/A
 50 REM (c) BAU January 199Ø
 60 :
 70 TIME=Ø
 80 C%=1
 90 REPEAT
 100 N%=2^C%*(2^(C%+1)-1)
 110 T%=1
 120 FOR F%=2 TO SQR(N%) STEP 2
 130 IF N% MOD F%=Ø T%=T%+F%+N% DIV F%
 140 NEXT
 150 IF T%=N% PRINT N%;"  (time=";TIME/
1ØØ;" secs)"
 160 C%=C%+1
 170 UNTIL FALSE
```

Listing 5

```
 10 REM >Clean (Agora 5)
 20 REM Disc 'cleaner'
 30 REM by Terry Blunt
 40 REM for Archimedes only
 50 REM (c) BAU January 199Ø
 60 :
 70 ON ERROR GOTO 21Ø
```

Continued ▶

RISC REVUE

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```
80 INPUT"Enter drive number to tidy "drive$
90 PRINT"Compacting..."
100 REPEAT
110 OSCLI"COMPACT :"+drive$
120 SYS "ADFS_FreeSpace",drive$ TO total%,greatest%
130 UNTIL total%=greatest%
140 PRINT"Filling..."
150 OSCLI"SAVE :"+drive$+".ZZZ 8FØØ +1ØØ"
160 F%=OPENOUT(":"+drive$+".ZZZ")
170 REPEAT
180 BPUT#F%,Ø
190 UNTIL FALSE
200 :
210 IF ERR=67782 THEN
220 CLOSE#F%
230 OSCLI"REMOVE :"+drive$+".ZZZ"
240 PRINT"Disc 'clean' on drive "drive$
250 ELSE
260 PRINT REPORT$" @ ";ELR
270 ENDIF
280 END
```

DIARY

Listing 1

```
1 REM Hemera Diary
2 REM by Rupert Thompson
3 REM for B/B+/M/C/A
4 REM (c) BAU January 199Ø
5 :
1Ø MODE 7:PROCsetup:PROCvar
15 ON ERROR PROCerror
16 VDU 3,6
2Ø end%=Ø:REPEAT:PROCmenu:UNTIL end%
3Ø PROCclose:MODE 7:*FX 4
35 END
36 :
4Ø DEF PROCsetup:PROCdh(Ø,134,Ø,"Hemera Desk Diary")
5Ø PRINTTAB(Ø,2);CHR$149;STRING$(39,CHR$163);TAB(Ø,23);CHR$149;STRING$(39,CHR$172);CHR$133;"ESCAPE returns to Options Menu";
6Ø VDU 28,Ø,22,39,3
7Ø *FX 4,1
8Ø ENDPROC
81 :
9Ø DEF PROCvar
1ØØ DIM record$(11),os 4Ø,title$(11),width%(11),val$(11),nu(11)
11Ø open%=Ø:f$=":Ø.$.":c$=CHR$&8A+CHR$&8B+CHR$&7F+CHR$9+CHR$&87+CHR$13:CD%=1:fu=-1:vi=-1:cf$="A":ser$=""
12Ø ENDPROC
121 :
2ØØ DEF PROCmenu:CLS:PROCdh(Ø,133,Ø,"Options Menu"):PRINT'" ";CHR$133;:IF open% THEN PRINT"Editing ";f$' ELSE PRINT"Editing no file"'
21Ø RESTORE 3ØØ:READ o$:REPEAT:PRINT;" ";CHR$134;o$:READ o$:UNTIL o$="*":PRINT:PRINTCHR$134;" *  - Operating System Command"''CHR$133;"Please select the option you require";
215 *FX 225,24Ø
22Ø REPEAT:G=GET:UNTIL G>239 AND G<25Ø OR G=42
225 PRINT:*FX 225,1
229 IF G=42 THEN PROCstar
23Ø IF G=24Ø THEN PROCopen
231 IF G=241 THEN PROCscan
232 IF G=242 THEN PROCautocal
233 IF G=243 THEN PROCgtd
234 IF G=244 THEN PROCinterr
235 IF G=245 THEN PROCcreate
236 IF G=246 THEN PROCprint
237 IF G=247 THEN PROChelp
238 IF G=248 THEN end%=FNsure("Exit program.")
29Ø ENDPROC
291 :
3ØØ DATA fØ - Open Diary File,f1 - Scan/Edit Diary,f2 - Auto-Insert Calendrical Data,f3 - Go to Day,f4 - Interrogate Diary,f5 - Create New Diary File,f6 - Print Diary,f7 - Help Screen,f8 - Exit Program HEMERA,*
3Ø1 :
31Ø DEF PROCerror:IF ERR=17 THEN ENDPROC
32Ø CLS:VDU 7:PROCdh(5,133,1,"ERROR!"):PRINTTAB(Ø,8);CHR$134;"The following error has occurred:":REPORT:PROCdh(12,133,Ø,"Press any key to continue"):G=GET:ENDPROC
321 :
33Ø DEF FNsure(o$):VDU 7:PRINT'CHR$133;o$;" Are you sure? (Y/N)";:REPEAT:G$=GET$:UNTIL INSTR("YyNn",G$)>Ø:=INSTR("Yy",G$)>Ø
331 :
34Ø DEF PROCclose:CLOSE# Ø:open%=Ø:f$="":ENDPROC
341 :
35Ø DEF PROCopfi(o$):PROCclose:F=OPENUP o$:IF F=Ø THENPROCerr("File not found!"):ENDPROC
36Ø PTR# F=Ø:INPUT# F,rec,recn,recs,f:PTR# F=255:INPUT# F,record$(Ø):Yr%=VALrecord$(Ø):f$=o$:open%=-1:CD%=1:ENDPROC
361 :
37Ø DEF PROCstar:PRINT'CHR$134;:INPUT"*"o$
38Ø PROCoscli(o$):PRINT'CHR$133;"Press any key to continue";:G=GET
39Ø IF G=42 THEN PROCstar
4ØØ ENDPROC
4Ø1 :
41Ø DEF PROCoscli(o$):$os=o$
42Ø X%=os MOD 256:Y%=os DIV 256
43Ø CALL &FFF7
44Ø ENDPROC
441 :
1ØØØ DEF FNeaster(Y%)
1Ø1Ø LOCAL M%,D%,I
1Ø2Ø RESTORE ((FNgoldn(Y%)-1)*1Ø)+1Ø7Ø
1Ø3Ø FOR I=Ø TO FNdomin(Y%):READ M%,D%:NEXT
1Ø4Ø =FNday(D%,M%,Y%)
1Ø41 :
1Ø5Ø DEF FNgoldn(Y%):LOCAL gn:gn=(Y%+1) MOD 19:IF gn=Ø THEN =19 ELSE =gn
1Ø51 :
1Ø6Ø DEF FNdomin(Y%)=(Y%+6+(Y% DIV 4)) MOD 7
1Ø61 :
1Ø7Ø DATA 4,16,4,15,4,21,4,2Ø,4,19,4,18,4,17
1Ø8Ø DATA 4,9,4,8,4,7,4,6,4,5,4,4,4,1Ø
1Ø9Ø DATA 3,26,3,25,3,24,3,3Ø,3,29,3,28,3,27
11ØØ DATA 4,16,4,15,4,14,4,13,4,12,4,18,4,17
111Ø DATA 4,2,4,1,4,7,4,6,4,5,4,3
112Ø DATA 4,23,4,22,4,21,4,2Ø,4,19,4,25,4,24
113Ø DATA 4,9,4,15,4,14,4,13,4,12,4,11,4,1Ø
114Ø DATA 4,2,4,1,3,31,3,3Ø,3,29,4,4,4,3
115Ø DATA 4,23,4,22,4,21,4,2Ø,4,19,4,18,4,17
116Ø DATA 4,9,4,8,4,7,4,6,4,12,4,11,4,1Ø
117Ø DATA 3,26,4,1,3,31,3,3Ø,3,29,3,28,3,27
118Ø DATA 4,16,4,15,4,14,4,2Ø,4,19,4,18,4,17
119Ø DATA 4,9,4,8,4,7,4,6,4,5,4,4,4,3
12ØØ DATA 3,26,3,25,3,24,3,23,3,29,3,28,3,27
121Ø DATA 4,16,4,15,4,14,4,13,4,12,4,11,4,17
122Ø DATA 4,2,4,1,3,31,4,6,4,5,4,4,4,3
123Ø DATA 4,23,4,22,4,21,4,2Ø,4,19,4,18,4,24
124Ø DATA 4,9,4,8,4,14,4,13,4,12,4,11,4,1Ø
125Ø DATA 4,2,4,1,3,31,3,3Ø,3,29,3,28,4,3
1251 :
126Ø DEF FNday(D%,M%,Y%):LOCAL I,T%
127Ø RESTORE 129Ø:T%=Ø:FOR I=1 TO M%:READ L%:T%=T%+L%:NEXT I
128Ø =T%+D%-((M%>2) AND FNleap(Y%))
1281 :
129Ø DATA Ø,31,28,31,3Ø,31,3Ø,31,31,3Ø,31,3Ø,31
1291 :
13ØØ DEF FNcentury(Y%)=1+(Y% DIV 1ØØ)
13Ø1 :
131Ø DEF FNyear(Y%)=Y% MOD 1ØØ
1311 :
132Ø DEF FNleap(Y%):IF FNyear(Y%)=Ø THEN=(Y% MOD 4ØØ=Ø) ELSE =(Y% MOD 4=Ø)
1321 :
133Ø DEF FNweekday(D%,M%,Y%):LOCAL I,T%
134Ø T%=FNyear(Y%)+(FNyear(Y%) DIV 4)+D%+(6*(FNcentury(Y%)-2Ø))
135Ø RESTORE 137Ø:FOR I=1 TO M%:READ m:NEXT I:IF M%<3 THEN m=m+FNleap(Y%)
136Ø =(T%+m) MOD 7
1361 :
137Ø DATA 1,4,4,Ø,2,5,Ø,3,6,1,4,6
1371 :
138Ø DEF FNddate(T%,Y%):LOCAL I:M%=FNmdate(T%,Y%):RESTORE 129Ø:FOR I=1 TO M%:READ L%:L%=L%-(FNleap(Y%) AND (I=3)):T%=T%-L%:NEXT I
139Ø =T%
1391 :
141Ø DEF FNmdate(T%,Y%):LOCAL I,V%:RESTORE 129Ø:READ V%
142Ø M%=Ø:REPEAT:M%=M%+1:READ L%:L%=L%-(FNleap(Y%) AND(M%=2)):T%=T%-V%:V%=L%:UNTIL T%<=L% OR M%=12
143Ø =M%
1431 :
2ØØØ DEF PROCdh(Y,c,f,m$):LOCAL I:I=(4Ø-LENm$-3)/2:f=f*136:PRINTTAB(I,Y);CHR$141;CHR$c;CHR$f;m$;TAB(I,Y+1);CHR$141;CHR$c;CHR$f;m$:ENDPROC
2ØØ1 :
2Ø1Ø DEF PROCerr(m$):VDU 7:PRINT:PROCdh(VPOS,133,1,"Error: "+m$):PROCdh(VPOS,133,1,"Press any key to continue"):G=GET:ENDPROC
2Ø11 :
2Ø2Ø DEF FNinput(X,Y,L%,O$,v$,N,P):LOCAL o$,n:flag=Ø:k=Ø:P=255+(P*32)
2Ø3Ø o$=O$:n=LEN O$:PRINTTAB(X,Y);CHR$133;">";TAB(X+2+L%,Y);"<"
2Ø4Ø REPEAT:PRINTTAB(X+2,Y);STRING$(L%,".");TAB(X+2,Y);o$;:REPEAT:G=GET:G$=CHR$(G AND (P+(32*(G>126 OR G<65)*(P=223)))):UNTIL INSTR(v$,G$)>Ø OR v$="" OR INSTR(c$,G$)>Ø
2Ø5Ø IF ASCG$=&7F THEN o$=FNindel
2Ø6Ø IF ASCG$=&87 THEN o$=FNincop
2Ø7Ø IF ASCG$=&9 THEN o$=FNintab
2Ø8Ø IF ASCG$=&8A THEN flag=1
2Ø9Ø IF ASCG$=&8B THEN flag=-1
21ØØ IF ASCG$>31 AND ASCG$<127 THEN o$=FNinadd(G$)
211Ø IF ASCG$=13 THEN flag=1
212Ø UNTIL flag<>Ø
213Ø IF N AND o$="" THEN 2Ø4Ø ELSE=o$
2131 :
214Ø DEF FNinadd(G$):IF n<L% THEN n=n+1:k=1:=o$+G$:ELSE VDU 7:=o$
2141 :
215Ø DEF FNindel:IF n>Ø THEN n=n-1:k=1:=LEFT$(o$,n):ELSE VDU 7:=o$
2151 :
216Ø DEF FNincop:n=Ø:k=1:=""
2161 :
217Ø DEF FNintab:n=LENO$:k=1:=O$
2171 :
218Ø DEF PROCmulti(F%,N%,P%,X%,Y%,S%)
219Ø flag=Ø:n=F%:IF P% THEN PROCpurge
2195 REPEAT:record$(n)=FNinput(X%,Y%+(S%*n),width%(n),title$(n),val$(n),nu(n),Ø)
22ØØ PRINTTAB(X%+1,Y%+(S%*n));SPC(width%(n)+2);TAB(X%+1,Y%+(S%*n));CHR$134;record$(n)
22Ø5 title$(n)=record$(n)
221Ø IF flag=1 AND n<N% THEN n=n+1:flag=F%
222Ø IF flag=-1 AND n>F% THEN n=n-1
223Ø UNTIL flag=1 AND n=N%
224Ø ENDPROC
2241 :
23ØØ DEF PROCpurge:LOCAL I:FOR I=Ø TO 11:record$(I)="":NEXT I:ENDPROC
23Ø1 :
231Ø DEF FNfilename
232Ø PRINTTAB(5,3);CHR$133;"Please enter the file name"
233Ø PRINTTAB(13,5);CHR$134;"Drive"
234Ø PRINTTAB(9,7);CHR$134;"Directory"
235Ø PRINTTAB(14,9);CHR$134;"Name"
236Ø width%(Ø)=1:width%(1)=1:width%(2)=7:title$(Ø)=MID$(f$,2,1):title$(1)=MID$(f$,4,1):title$(2)=MID$(f$,6):val$(Ø)="Ø123":val$(1)="":val$(2)="":nu(Ø)=-1:nu(1)=-1:nu(2)=-1
237Ø PROCmulti(Ø,2,TRUE,21,5,2)
238Ø =":"+record$(Ø)+"."+record$(1)+"."+record$(2)
239Ø ENDPROC
2391 :
3ØØØ DEF PROCopen:CLS:PROCdh(Ø,133,Ø,"Open New File")
3Ø2Ø PROCopfi(FNfilename)
3Ø3Ø ENDPROC
3Ø31 :
3Ø4Ø DEF PROCcreate:LOCAL I,n:PROCclose:CLS:PROCdh(Ø,133,Ø,"Create New File"):ff$=FNfilename
3Ø5Ø PRINTTAB(5,14);CHR$133;"Year of Diary?":REPEAT:Yr%=VALFNinput(21,14,4,"","123456789Ø",-1,Ø):UNTIL Yr%>1889 AND Yr%<21ØØ
3Ø6Ø PRINT':IF NOT FNsure("Create this file.") THEN ENDPROC
3Ø7Ø CLS:PROCdh(7,133,1,"Creating File "+ff$):PROCdh(1Ø,133,1,"Please wait")
3Ø8Ø  recn=366-FNleap(Yr%):rec=recn+1:f=12:RESTORE 33ØØ:FOR I=Ø TO 11:READ title$(I):width%(I)=3Ø:NEXT I:recs=384
3Ø9Ø DUM=OPENOUT(ff$):CLOSE# DUM:DUM=OPENUP(ff$):PTR# DUM=(recn*recs):BPUT# DUM,48:CLOSE# DUM
31ØØ F=OPENUP(ff$)
311Ø PTR# F=Ø:PRINT# F,rec,recn,recs,f:FOR I=Ø TO 11:PRINT# F,width%(I),title$(I):NEXT:PTR# F=255
312Ø PROCpurge:record$(Ø)=STR$ Yr%:FOR I=Ø TO 11:PRINT# F,record$(I):NEXT I
3125 PRINTTAB(15,16);CHR$134;"Record"
313Ø  D%=FNweekday(1,1,Yr%)-1:T%=1:FOR I=1 TO 12:RESTORE 129Ø:FOR n=Ø TO I:READ dd%:NEXT n:m$=FNmname(I):FOR n=1 TO dd%-(FNleap(Yr%) AND I=2):D%=(D%+1) MOD 7:record$(Ø)=FNdname(D%)+" "+STR$n+" "+m$+", "+STR$Yr%:PRINTTAB(23,16);T%:PROCwrite(T%)
314Ø T%=T%+1:NEXT n:NEXT I:PROCopfi(ff$):VDU 7:ENDPROC
3141 :
315Ø DEF FNdname(T%):LOCAL d$,I:RESTORE 316Ø:FOR I=Ø TO T%:READ d$:NEXT I:=d$
3151 :
316Ø DATA Saturday,Sunday,Monday,Tuesday,Wednesday,Thursday,Friday
3161 :
317Ø DEF FNmname(M%):LOCAL m$,I:RESTORE 318Ø:FOR I=1 TO M%:READ m$:NEXT I:=m$
3171 :
318Ø DATA January,February,March,April,May,June,July,August,September,October,November,December
3181 :
319Ø DEF PROCptr(I):PTR# F=255+(recs*I):ENDPROC
3191 :
32ØØ DEF PROCwrite(I):LOCALn:PROCptr(I):FORn=Ø TO11:PRINT#F,record$(n):NEXTn:ENDPROC
32Ø1 :
321Ø DEF PROCread(I):LOCAL n:PROCptr(I):FOR n=Ø TO 11:INPUT# F,record$(n):NEXT n:ENDPROC
3211 :
33ØØ DATA Date,Title,Memo,Memo,Memo,Memo,Memo,Memo,Memo,Memo,Memo,Memo
33Ø1 :
331Ø DEF PROCsh(Y,C,F,m$):LOCAL I:I=(4Ø-LENm$-2)/2:PRINTTAB(I,Y);CHR$C;CHR$(F*136);m$:ENDPROC
3311 :
34ØØ DEF PROCscanrec(rec):PROCread(rec):CLS:PROCdh(Ø,133,Ø,record$(Ø))
34Ø5 PROCsh(3,134,Ø,record$(1))
341Ø FOR n=1 TO 1Ø:PRINTTAB(6,4+n);CHR$134;record$(n+1):NEXT n
343Ø FOR n=1 TO 1Ø:PRINTTAB(1,4+n);CHR$134;n:NEXT n
344Ø ENDPROC
3441 :
345Ø DEF PROCscan:IF NOT open% THEN VDU 7:ENDPROC
346Ø LOCAL I,n
347Ø REPEAT:PROCscanrec(CD%)
348Ø PRINTTAB(Ø,16);CHR$133;"[    Yesterday";TAB(2Ø,16);"]   Tomorrow";TAB(Ø,17);CHR$133;"COPY Edit Memos";TAB(2Ø,17);"TAB Edit Title";TAB(Ø,18);CHR$133;"G   Go to Day";TAB(2Ø,18);"S   Search Diary";
349Ø REPEAT:G=GET:UNTIL G>&86 AND G<&8A OR G=9 OR (G AND 223)=71 OR (G AND 223)=83
3491 IF G=&88 THEN CD%=FNcdy
3492 IF G=&89 THEN CD%=FNcdt
3493 IF G=&87 THEN PROCeditm
3494 IF G=9 THEN PROCeditt
3495 IF (G AND223)=71 THEN PROCgtd
3496 IF (G AND223)=83 THEN PROCinterr
35ØØ UNTIL FALSE:ENDPROC
35Ø1 :
351Ø DEF FNcdy:IF CD%=1 THEN =recn-1 ELSE =CD%-1
3511 :
352Ø DEF FNcdt:IF CD%=recn-1 THEN =1 ELSE =CD%+1
3521 :
353Ø DEF PROCeditm:LOCAL I,n:FOR I=2 TO 11:title$(I)=record$(I):nu(I)=Ø:width%(I)=3Ø:val$(I)="":NEXT I
354Ø FOR I=16 TO 18:PRINTTAB(Ø,I);SPC(39);:NEXT I
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Continued ▶

DIARY

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3545 PRINTTAB(0,17);CHR$133;"RETURN/DOW
N at last field to end"
3550 PROCmulti(2,11,0,5,3,1)
3560 PRINTTAB(0,17);SPC(39):IF NOT FNsu
re("Save these entries") THEN ENDPROC
3570 PROCwrite(CD%):ENDPROC
3571 :
3580 DEF PROCgtd:LOCAL I,n,v:IF NOT ope
n% THEN VDU 7:ENDPROC:ELSE:REPEAT:CLS:PR
OCdh(0,133,0,"GO TO DAY"):PROCsh(3,133,0
,"Please enter the date you require:")
3590 title$(0)="":val$(0)="0123456789":
nu(0)=-1:width%(0)=2:title$(1)="":val$(0
)="0123456789":nu(0)=-1:width%(1)=2
3600 PRINTTAB(16,5);CHR$134;"Day";TAB(1
4,7);CHR$134;"Month"
3610 PROCmulti(0,1,TRUE,20,5,2)
3620 v=0:M%=VALrecord$(1):D%=VALrecord$
(0):IF M%>12 OR M%<1 THEN v=1 ELSE RESTO
RE 1290:FOR I=0 TO M%:READ dd%:NEXT I:IF
 D%>dd%-(FNleap(Yr%) AND M%=2) THEN v=1
3625 IF v=1 THEN PROCerr("Invalid Date!
")
3630 UNTIL v=0
3640 CD%=FNday(D%,M%,Yr%):PROCscan:ENDP
ROC
3641 :
3650 DEF PROCeditt:LOCAL I,n:FOR I=16 T
O 18:PRINTTAB(0,I);SPC(39);:NEXT I
3660 PROCsh(16,133,0,"Enter the new tit
le above."):record$(1)=FNinput(3,3,30,re
cord$(1),"",0,0):PRINTTAB(0,17)
3670 IF NOT FNsure("Save this title.")
THEN ENDPROC
3680 PROCwrite(CD%):ENDPROC
3681 :
3690 DEF PROCinterr:LOCAL I,n:IF NOT op
en% THEN VDU 7:ENDPROC
3700 REPEAT:PROCintmen:UNTIL FALSE
3710 ENDPROC
3711 :
3720 DEF PROCintmen:CLS:PROCdh(0,133,0,
"Search Menu"):PRINT'CHR$133;"Settings:
";:IF fu THEN PRINT"Fuzzy, ";:ELSE PRINT
"Specific, ";
3721 IF vi THEN PRINT"View." ELSE PRINT
"Edit."
3722 PRINT:RESTORE 3800:READ m$:REPEAT:
PRINTCHR$134;m$:READ m$:UNTIL m$="*"
3725 PRINT'CHR$133;"Please select the o
ption you require";
3730 *FX 225,240
3740 REPEAT:G=GET:UNTIL G>239 AND G<250
3750 IF G=240 THEN PROCsearch
3751 IF G=241 THEN fu=NOTfu
3752 IF G=242 THEN vi=NOTvi
3753 IF G=243 THEN PROCselfl
3754 IF G=244 THEN PROCseltg
3760 *FX 225,1
3770 ENDPROC
3771 :
3800 DATA f0 - Begin Search,f1 - Toggle
 Fuzzy/Specific,f2 - Toggle View/Edit,f3
 - Select Field,f4 - Select Target,"",ES
CAPE returns to Options Menu,*
3801 :
3810 DEF PROCselfl:CLS:PROCdh(0,133,0,"
Select Search Field"):PROCsh(3,134,0,"Cu
rrent Search Field: "+cf$):PROCsh(5,133,
0,"Enter new Search Field below:"):PRINT
TAB(5,7);CHR$134;"A = Any Field";TAB(5,8
);CHR$134;"T = Title Field"
3820 PRINTTAB(5,9);CHR$134;"M = All Mem
o Fields";TAB(2,10);CHR$134;"1-10 = Spec
ific Memo Field"
3830  REPEAT:cf$=FNinput(18,12,2,cf$,"0
123456789ATM",-1,-1):UNTIL cf$="T" OR cf
$="A" OR cf$="M" OR (VALcf$>0 AND VALcf$
<11)
3840 ENDPROC
3841 :
3850 DEF PROCseltg:CLS:PROCdh(0,133,0,"
Select Search Target"):PROCsh(3,133,0,"E
nter new Search Target below:")
3860 ser$=FNinput(3,5,30,ser$,"",0,0)
3870 ENDPROC
3871 :
3880 DEF PROCsearch:LOCAL I,n,t,f,flag:
f=VALcf$+1:flag=-1:IF cf$="A" THEN f=100
 ELSE IF cf$="M" THEN f=200
3890 FOR I=1 TO recn:PROCread(I):PROCpl
w:t=0:FOR n=1 TO 11:t=FNser(record$(n),s
er$,f)
3900 NEXT n:CD%=I:IF vi AND t THEN PROC
scanrec(CD%):PRINTTAB(0,19);CHR$133;"Pre
ss SPACE BAR to continue";:REPEAT:UNTIL
GET=32:flag=-1:ELSE IF t PROCscan
3910 t=0:NEXT I
3920 ENDPROC
3921 :
3930 DEF FNser(f$,t$,f):IF t THEN =t
3935 IF n<>f AND f<100 THEN =t ELSE IF
f=200 AND f=1 THEN =t
3940 IF fu AND INSTR(f$,t$)>0 AND f$<>"
" THEN =TRUE
3950 IF f$=t$ THEN =TRUE
3960 =FALSE
3961 :
3970 DEF PROCplw:IF flag THEN CLS:PROCd
h(7,133,1,"SEARCHING"):PROCdh(10,133,1,"
Please wait"):flag=0
3980 ENDPROC
3981 :
3990 DEF PROCautocal:LOCAL I,n,e,m$,k
3991 IF NOT open% THEN VDU 7:ENDPROC
3995 CLS:PROCdh(7,133,1,"Inserting Cale
ndrical Information"):PROCdh(10,133,1,"P
lease wait")
4000 e=FNeaster(Yr%):CD%=e:PROCread(CD%
):record$(1)="Easter Sunday":PROCwrite(C
D%)
4010 RESTORE 4100:FOR I=1 TO 10:READ n,
m$:PROCread(e+n):record$(1)=m$:PROCwrite
(e+n):NEXT I
4020 k=4109:REPEAT:k=k+1:RESTORE k:READ
 Dd%,Mm%,m$:n=FNday(Dd%,Mm%,Yr%):PROCrea
d(n):record$(1)=m$:PROCwrite(n):UNTIL m$
=""
4030 FOR I=1 TO 3:RESTORE k+I:READ D%,M
%,r:w=FNweekday(D%,M%,Yr%):IF w=0 THEN W
=7 ELSE IF w=1 THEN w=8
4031 m=r-w:n=FNday(D%,M%,Yr%)+m:PROCrea
d(n):IF record$(1)="" THEN record$(1)="B
ank Holiday" ELSE record$(1)=LEFT$(recor
d$(1)+" (BH)",30)
4032 PROCwrite(n):NEXT I
4035 IF FNweekday(D%,M%,Y%)=0 THEN n=n+
2
4036 IF FNweekday(D%,M%,Y%)=1 THEN n=n+
1
4040 m=FNweekday(1,1,Yr%):IF m=0 THEN n
=3 ELSE IF m=1 THEN n=2 ELSE n=1
4050 PROCread(n):record$(1)=LEFT$(recor
d$(1)+" (Hol)",30):PROCwrite(n)
4055 m=1-FNweekday(30,11,Yr%):IF ABS m>
3 THEN m=SGNm*(7-ABSm)
4056 n=FNday(30,11,Yr%)+m:PROCread(n):r
ecord$(1)="Advent Sunday":PROCwrite(n)
4060 n=FNday(25,12,Yr%):m=FNweekday(25,
12,Yr%):IF m>1 THEN ENDPROC:FOR I=0 TO m
:PROCread(n+I+1):IF record$(1)="" THEN r
ecord$(1)="Bank Holiday" ELSE record$(1)
=LEFT$(record$(1)+" (BH)",30)
4061 PROCwrite(n+I+1):NEXT I
4070 ENDPROC
4100 DATA -63,Septuagesima Sunday,-56,S
exagesima Sunday,-49,Quinquagesima Sunda
y,-42,Quadragesima Sunday,35,Rogation Su
nday,39,Ascension Day,49,Whit-Sunday,56,
Trinity Sunday,-2,Good Friday (BH),1,Eas
ter Monday (GB)
4110 DATA 1,1,Circumcision of Our Lord
4111 DATA 8,9,The Blessed Virgin Mary
4112 DATA 6,1,Epiphany of Our Lord
4113 DATA 25,1,Conversion of St Paul
4114 DATA 2,2,Purif of the Virgin Mary
4115 DATA 14,2,St. Valentine
4116 DATA 24,2,St. Matthias
4117 DATA 25,3,Annunciation of Virgin M
ary
4118 DATA 23,4,St. George
4119 DATA 1,5,St. Philip & St. James
4120 DATA 11,6,St. Barnabas
4121 DATA 24,6,St. John the Baptist
4122 DATA 29,6,St. Peter
4123 DATA 2,7,Visitation of Virgin Mary
4124 DATA 22,7,St. Mary Magdalen
4125 DATA 25,7,St. James
4126 DATA 6,8,Transfiguration
4127 DATA 24,8,St. Bartholemew
4128 DATA 14,9,Holy Cross Day
4129 DATA 21,9,St. Matthew
4130 DATA 29,9,St. Michael & All Angels
4131 DATA 30,9,St. Jerome
4132 DATA 18,10,St. Luke
4133 DATA 28,10,St. Simon & St. Jude
4134 DATA 1,11,All Saints' Day
4135 DATA 30,11,St. Andrew
4136 DATA 21,12,St. Thomas
4137 DATA 25,12,Christmas Day
4138 DATA 27,12,St. John Evangelist
4139 DATA 28,12,Holy Innocents
4140 DATA 2,11,All Souls' Day
4141 DATA 30,11,St. Andrew
4142 DATA 21,12,St. Thomas
4143 DATA 25,12,Christmas Day
4144 DATA 27,12,St. John Evangelist
4145 DATA 28,12,Holy Innocents
4146 DATA 1,3,St. David
4147 DATA 17,3,St. Patrick
4148 DATA 24,12,Christmas Eve
4149 DATA 31,10,Hallowe'en
4150 DATA 26,12,St. Stephen. Boxing Day
.
4151 DATA 5,11,Guy Fawkes' Night
4152 DATA 0,0,""
4153 DATA 1,5,9
4154 DATA 31,5,2
4155 DATA 31,8,2
4156 :
5000 DEF PROChelp:REPEAT:CLS:PROCdh(0,1
33,0,"Help Menu"):PRINT':RESTORE 5200
5010 READ m$:REPEAT:PRINTCHR$(134);m$:R
EAD m$:UNTIL m$="*":PRINT
5020 PRINTCHR$(133);"Select the Subject
 you require";:*FX 225,240
5030 REPEAT:G=GET:UNTIL G<248 AND G>239
5035 *FX 225
5040 RESTORE (G*10)+3000:CLS:READ m$:PR
OCdh(0,133,0,"Help - "+m$):PRINT:READ m$
:PROCsh(3,133,0,m$):PRINT:READ m$:REPEAT
:PRINT m$:READ m$:UNTIL m$="*":PRINTTAB(
0,19);CHR$133;"Press any key to continue
";:G=GET
5050 UNTIL FALSE:ENDPROC
5051 :
5200 DATA f0 - The Versatile Input Edit
or,f1 - Creating a Diary,f2 - Opening a
Diary,f3 - Browsing through a Diary,f4 -
 Editing Diary entries,f5 - Searching a
Diary,f6 - Auto-Calendrical Information,
f7 - Operating System Commands,*
5400 DATA The Editor,""
5401 DATA "When the Editor is in use (
ie when you enter data inmagentabetwe
en the >.< signs) the following keys a
re used :-","","COPYdeletes the whole
line","TABrestores the line","RETURN,
 UP, DOWN,end the editing",""
5402 DATA "When editing several fields
,UPand   DOWNmove freely between th
em. Only    the current field is in mag
enta.","*"
5410 DATA Creating a Diary
5411 DATA "OPTIONS MENU, f5","You just
 enter a name for the Diary    File (Dr
ive, Directory, Filename) and  the year
 for which the diary is to be  created.
 HEMERA creates the Diary aut- omatical
ly. This takes quite some time"
5412 DATA "to finish, so be patient!",
*
5420 DATA Opening a Diary,"OPTIONS MENU
, f0"
5421 DATA "Before you can browse throu
gh or edit  a Diary, you mustOPENit,
much like   opening up a real book.",""
,"To open a Diary, select Option f0 fro
m the Options Menu and enter the drive,
  directory, and name of the Diary."
5422 DATA "HEMERA will open the Diary
for you.    When the Diary is open, its
 name is    written under the title of
the Options Menu."
5423 DATA *
5430 DATA Browsing,"OPTIONS MENU, f1"
5431 DATA "When you select this option
, the Diary is displayed day by day. Ca
lendrical   Information (Saints' Days,
Holidays,   etc.) is shown underneath t
he date,    and up to 10 memoranda bene
ath that.",""
5432 DATA "The keys[and]are used t
o move back and forth in the Diary.",""
,"To make larger jumps, pressGand ent
erthe date you require. This is also av
a-ilable from the Options Menu, f3.",*
5440 DATA Editing a Diary,"OPTIONS MENU
, f1"
5441 DATA "When browsing through a Dia
ry, the     following keys allow you to
 edit the   entries for the day on the
screen:-","","TABlets you change the C
alendrical    heading."
5442 DATA "","COPYlets you edit the m
emoranda. The  normal Editor controls (
qv) are now    in use.DOWNorRETURNa
t Memo 10 ends the editing.",*
5450 DATA Searching a Diary,"OPTIONS ME
NU, f4"
5451 DATA "FUZZYmeans that the search
 target is  contained withinthe target
 field.","SPECIFICmeans that the searc
h target  must actually bethe target f
ield.","","VIEWdisplays all days which
 fulfill   the search criteria in turn.
"
5452 DATA "EDITputs you in Browse Mod
e at the    first day which fulfills th
e crieria.","","TheTARGET FIELDis the
 field yoy wish to search.","TheSEARC
HTARGETis the word or phraseyou are l
ooking for.",*
5460 DATA Calendrical Data,"OPTIONS MEN
U, f2"
5461 DATA "Calendrical Information inc
ludes such  things as Saints' Days, Hol
idays, etc. These will be calculated an
d inserted  into the Diary automaticall
y at the    press of f2.",*
5470 DATA OS Commands,"or * Commands"
5471 DATA "Operating System Commands a
re those    that begin with an asterisk
, eg*CAT,  *DRIVE, *INFO, *HELP.","","
You may enter any * Command from the
Options Menu. Avoid Commands which may
affect the Computer's memory, such as:"
5472 DATA "*LOAD, *COMPACT, *COPY, *BA
CKUP",*
5473 :
6000 DEF PROCprint:LOCAL I,n,v:IF NOT o
pen% THEN VDU 7:ENDPROC
6005 PROCon
6010 REPEAT:CLS:PROCdh(0,133,0,"Printer
 Options Menu")
6020 PRINT':RESTORE 6100:READ m$:REPEAT
:PRINTCHR$134;m$:READ m$:UNTIL m$="*"
6030 PRINT'CHR$133;"Please select the O
ption you require";:
6040 *FX 225,240
6050 REPEAT:G=GET:UNTIL G>239 AND G<250
6061 IF G=241 THEN PROCmonthppfs
6062 IF G=242 THEN PROCweekppfs
6063 IF G=243 THEN PROCdayppfs
6064 IF G=244 THEN PROCmonthppsm
6066 IF G=245 THEN PROCweekppsm
6067 IF G=246 THEN PROCdayppsm
6070 UNTIL FALSE
6080 ENDPROC
6081 :
6090 DEF FNon:*FX 21,3
6095 VDU 2,1,0,1,0,3:=(ADVAL-4=63)
6096 DEF PROCon:IF FNon THEN ENDPROC:EL
SE CLS:VDU 7:PROCdh(5,133,0,"The Printer
 is off-line."):PROCdh(8,133,0,"Please p
ress the ON LINE button,"):PROCdh(11,133
,0,"or turn the Printer ON."):REPEAT:UNT
IL FNon:ENDPROC
6097 :
6100 DATA "f1 - Month per page, full si
ze","f2 - Week per page, full size","f3
- Day per page, full size","","f4 - Mont
h per page, FiloFax size","f5 - Week per
 page, FiloFax size"
6110 DATA "f6 - Day per page, FiloFax s
ize",*
6111 :
6120 DEF PROCpc(f):LOCAL I:RESTORE f+61
40:READ I:REPEAT:VDU 1,I:READ I:UNTIL I=
500
6130 ENDPROC
6131 :
6140 DATA 15,500
6141 DATA 18,500
6142 DATA 27,87,1,500
6143 DATA 27,87,0,500
6144 DATA 27,71,500
6145 DATA 27,72,500
6146 DATA 27,83,0,500
6147 DATA 27,84,500
6148 DATA 27,45,1,500
6149 DATA 27,45,0,500
6200 DEF FNgetcha(X,Y,P,v$):LOCAL G
6210 PRINTTAB(X,Y);CHR$(133);">";TAB(X+
3,Y);"<";TAB(X+2,Y);
6220 REPEAT:G=GET:IF P THEN G=G AND &DF
6230 UNTIL INSTR(v$,CHR$G)>0:PRINTTAB(X
+2,Y);CHR$G
6240 =CHR$G
6241 :
6250 DEF FNwhole:LOCAL G$:PRINTTAB(0,5)
;CHR$134;"Whole year, or one month? (Y/M
)":G$=FNgetcha(32,5,-1,"YM")
6260 IF G$="Y" THEN =-1
6270 PRINTTAB(14,7);CHR$134;"Month":REP
EAT:m=VALFNinput(21,7,2,"","0123456789",
-1,0):UNTIL m>0 AND m<13
6280  =m
6281 :
6290 DEF FNpause
6300 PRINTTAB(5,9);CHR$134;"Pause betwe
en pages? (Y/N)":=(FNgetcha(32,9,-1,"YN"
)="Y")
6301 :
6310 DEF FNlength:LOCAL I:PRINTTAB(5,11
);CHR$134;"Page length (in lines) :":REP
EAT:I=VALFNinput(31,11,2,"65","012345678
9",-1,0):UNTIL I>64 AND I<70:=I
6311 :
6320 DEF PROCdayppfs:LOCAL I,n,v,G,pa,p
l,pg:pg=0
6330 CLS:PROCdh(0,133,0,"Day Per Page,
Full Size"):M%=FNwhole:pa=FNpause:pl=FNl
ength
6340 PRINTTAB(0,18);:IF NOT FNsure("Pri
nt diary.")THEN ENDPROC
6350 VDU 2:PROCdayper1(70,pl,pa,20,-1,5
6):ENDPROC
6351 :
6360 DEF PROCdayper1(wi,pl,pa,li,sp,pu)
:pg=0:LOCAL I,n:IF M%=-1 THEN A=1:B=12:E
LSE A=M%:B=M%
6361 FOR I=A TO B
6365 M$=FNmname(M%)+" "+STR$Yr%
6370 RESTORE 1290:FOR n=0 TO I:READ dd%
:NEXT n:FOR D%=1 TO dd%-(FNleap(Yr%) AND
(I=2)):PROCread(FNday(D%,M%,Yr%))
6380 PRINTTAB(5);:PROCpc(8):pg=NOT pg:I
F pg THEN PRINTSPC(wi-LENM$);
6390 PRINT M$;:IF NOT pg THEN PRINTSPC(
wi-LENM$);
6400 PROCpc(9):PRINT:m$=FNdname(FNweekd
ay(D%,M%,Yr%))+" "+STR$D%:n=LENm$*2:PRIN
T'TAB(5-pg*(wi-n));:PROCpc(2):PRINTm$:PR
OCpc(3):n=LENrecord$(1):PRINTTAB(5-pg*(w
i-n));record$(1)
6410 PRINT:FOR n=2 TO 11:PRINTTAB(5);re
cord$(n):NEXT n
```

Continued ▶

DIARY

◀ Continued

```
6420 PRINT:PROCLines(wi,li,sp):PROCpad(pl-pu)
6430 IF pa THEN PROCpause
6440 NEXT D%:NEXT I:VDU 3
6450 ENDPROC
6451 :
6490 DEF PROCpause:VDU 3
6500 CLS:VDU 7:PROCdh(7,134,1,"PAPER!"):PROCdh(10,133,0,"Press any key to continue"):G=GET:VDU 2:ENDPROC
6501 :
6510 DEF PROCLines(l,n,sp):LOCAL I:FOR I=1 TO n:IF sp THEN PRINT
6515 PRINTTAB(5);STRING$(l,"_"):NEXT I:ENDPROC
6516 :
6520 DEF PROCpad(n):LOCAL I:FOR I=1 TO n:PRINT:NEXT I:ENDPROC
6521 :
6530 DEF PROCdayppsm:LOCAL I,G,n,v:CLS:PROCdh(0,133,0,"Day Per Page, FiloFax Size"):M%=FNwhole:pa=FNpause:PRINTTAB(0,18);:IF NOT FNsure("Print diary.")THEN ENDPROC
6540 VDU 2:PROCpc(0):PROCdayper1(46,41,pa,19,0,36):VDU 2:PROCpc(1):VDU 3:ENDPROC
6541 :
6550 DEF PROCmonthppfs:CLS:PROCdh(0,133,0,"Month Per Page, Full Size"):M%=FNwhole:IF M%=-1 THEN pa=FNpause ELSE pa=0
6555 pl=FNlength:PRINTTAB(0,18);:IF NOT FNsure("Print Diary.")THEN ENDPROC
6560 VDU 2:PROCmonthper1(70,pl,1,2):ENDPROC
6561 :
6570 DEF PROCmonthper1(wi,pl,li,ad):LOCAL I,n
6580 pg=0:IFM%=-1 THEN A=1:B=12:ELSE A=M%:B=M%
6585 FOR I=A TOB
6590 pg=NOT pg:M$=FNmname(I)+" "+STR$Yr%:RESTORE 1290:FOR n=0 TO I:READ dd%:NEXT n:v=1+(dd%*(1+li))
6600 n=LENM$*2-ad:PRINTTAB(5);:PROCpc(8):IF pg THEN PRINTSPC(wi-n);
6610 PROCpc(2):PRINT M$;:PROCpc(3):IF NOT pg THEN PRINTSPC(wi-n);
6620 PROCpc(9):PRINT:FOR n=1 TO dd%-(FNleap(Yr%) AND I=2):PRINTTAB(5);:IF li=0 THEN PROCpc(8)
6630 PROCread(FNday(n,I,Yr%)):PROCpc(2):PRINT;n;TAB(8);LEFT$(record$(0),1);:PROCpc(3):PRINT" ";record$(1);SPC(wi-6-LENrecord$(1))
6640 IF li=1 THEN PRINTTAB(5);:PROCpc(8):PRINTTAB(14);record$(2);SPC(wi-7-LENrecord$(2))
6650 PROCpc(9):NEXT n:PROCpad(pl-v):IF pa PROCpause
6660 NEXT I:VDU 3:ENDPROC
6661 :
6670 DEF PROCmonthppsm:CLS:PROCdh(0,133,0,"Month Per Page, FiloFax Size"):M%=FNwhole:IF M%=-1 THEN pa=FNpause ELSE pa=0
6680 PRINTTAB(0,18);:IF NOT FNsure("Print Diary.")THEN ENDPROC
6690 VDU 2:PROCpc(0):PROCmonthper1(46,41,0,3):VDU 2:PROCpc(1):VDU 3:ENDPROC
6691 :
6700 DEF PROCweekper1(wi,pl,li,pd):pg=0
6710 LOCAL I,n,v,m$,k$:v=FNweekday(1,1,Yr%)
6720 FOR I=A TO B:n=FNmdate(I*7,Yr%):k$=FNmname(n)+" "+STR$Yr%:pg=NOTpg
6730 PRINTTAB(5);:PROCpc(8):IF pg THEN PRINT SPC(wi-LENk$);
6740 PRINT k$;:IF NOT pg THEN PRINTSPC(wi-LENk$);
6750 PROCpc(9):PRINT'
6760 FOR Dd=1 TO 7:D=Dd MOD 7:IF Dd<v AND I=0 OR Dd>FNweekday(31,12,Yr%) AND I=52 THEN PROCnull ELSE PROCwppday
6770 NEXT Dd:PROCpad(pl-pd):IF pa THEN PROCpause
6780 NEXT I:VDU 3:ENDPROC
6781 :
6790 DEF PROCnull:LOCAL I:FOR I=1 TO li+3:PRINT:NEXT I:PRINTTAB(5);:PROCpc(8):PRINTSPC(wi):PROCpc(9):ENDPROC
6791 :
6800 DEF PROCwppday:PROCread((I*7)+Dd+1-v):n=FNddate((I*7)+Dd+1-v,Yr%):M%=FNmdate((I*7)+Dd+1-v,Yr%):m$=FNdname(FNweekday(n,M%,Yr%))+" "+STR$n
6810 PRINTTAB(5-pg*(wi-(LENm$*2)));:PROCpc(2):PRINT m$:PROCpc(3):PRINTTAB(5-pg*(wi-LENrecord$(1)));record$(1):n=NOTpg
6820 FOR x=2 TO li+2:PRINTTAB(5-n*(wi-LENrecord$(x)));record$(x):NEXT x:PRINTTAB(5);:PROCpc(8):PRINTSPC(wi):PROCpc(9):ENDPROC
6821 :
6830 DEF PROCweekppfs:CLS:PROCdh(0,133,0,"Week Per Page, Full Size"):M%=FNwhole:pa=FNpause:pl=FNlength:PRINTTAB(0,18);:IF NOT FNsure("Print Diary.") THEN ENDPROC
6835 IF M%=-1 THEN A=0:B=52:ELSE PROCnotall
6840 VDU 2:PROCweekper1(70,pl,4,60):ENDPROC
6841 :
6850 DEF PROCnotall:A=FNday(1,M%,Yr%) DIV 7:RESTORE 1290:FOR I=0 TO M%:READ Dd%:NEXT I:B=FNday(Dd%,M%,Yr%) DIV 7:IF FNweekday(Dd%,M%,Yr%)=0 THEN B=B-1
6860 ENDPROC
6861 :
6870 DEF PROCweekppsm:CLS:PROCdh(0,133,0,"Week Per Page, FiloFax Size"):M%=FNwhole:pa=FNpause:IF M%=-1 THEN A=0:B=52:ELSE PROCnotall
6875 PRINTTAB(0,18);:IF NOT FNsure("Print Diary.")THEN ENDPROC
6880 VDU 2:PROCpc(0):PROCweekper1(46,41,1,40):VDU 2:PROCpc(1):VDU 3:ENDPROC
```

WORD GAMES

Listing 1

```
10 REM >BP-SM
20 REM BBC Program to pick a random word from SpellMaster
30 :
40 DEF PROCcode
50 DIM code 400
60 smslot=2
70 sminit=&9273
80 smnext=&98AC
90 FOR I%=0 TO 2 STEP 2:P%=&900
100 [OPT I%
110 .count
120 JSR setup
130 LDA #0
140 STA num
150 STA num+1
160 JSR init
170 BCS counted
180 .cloop
190 JSR smnext
200 BCS counted
210 INC num
220 BNE cloop
230 INC num+1
240 BNE cloop
250 .counted
260 JSR setdown
270 LDA num
280 LDX num+1
290 RTS
300 :
310 .pick
320 STX num
330 STY num+1
340 JSR setup
350 JSR init
360 .ploop
370 JSR smnext
380 BCS pend
390 DEC num
400 LDA num
410 CMP #255
420 BNE ploop
430 DEC num+1
440 LDA num+1
450 CMP #255
460 BNE ploop
470 .pend
480 LDY #0
490 .move
500 LDA &632,Y
510 STA word+2,Y
520 INY
530 CPY &66
540 BNE move
550 LDA #13
560 STA word+2,Y
570 JMP setdown
580 :
590 .setup
600 LDA &F4
610 STA rom
620 LDA #smslot
630 STA &F4
640 STA &FE30
650 LDX #&26
660 .savezero
670 LDA &60,X
680 STA sixty,X
690 DEX
700 BPL savezero
710 LDA &BFE0
720 LDA word
730 STA &69
740 LDA word+1
750 STA &6A
760 RTS
770 :
780 .init
790 LDA #&20
800 STA &63
810 LDA #6
820 STA &64
830 LDA #0
840 STA &68
850 JMP sminit
860 :
870 .setdown
880 LDX #&26
890 .loadzero
900 LDA sixty,X
910 STA &60,X
920 DEX
930 BPL loadzero
940 LDA rom
950 STA &F4
960 STA &FE30
970 RTS
980 :
990 .rom
1000 BRK
1010 .num
1020 BRK:BRK
1030 .sixty
1040 EQUS STRING$(40," ")
1050 .word
1060 ]NEXT
1070 ENDPROC
1080 :
1090 DEF FNpick
1100 REPEAT
1110 FOR i%=0 TO 1
1120 i%?word=64+RND(26)
1130 NEXT
1140 n%=USR(count)AND&FFFF
1150 UNTIL n%<>0
1160 rnd%=RND(n%)-1
1170 X%=rnd% MOD 256
1180 Y%=rnd% DIV 256
1190 CALL pick
1200 =$word
```

Listing 2

```
10 REM >BC-SM
20 REM BBC Program to check a word is in SpellMaster
30 :
40 DEF PROCcode
50 smslot=2
60 sminit=&9273
70 smnext=&98AC
80 DIM code 400
90 FOR I%=0 TO 2 STEP 2:P%=code
100 [OPT I%
110 .check
120 LDA &F4
130 STA rom
140 LDA #smslot
150 STA &F4
160 STA &FE30
170 LDX #&26
180 .savezero
190 LDA &60,X
200 STA sixty,X
210 DEX
220 BPL savezero
230 LDA &BFE0
240 LDA #&20
250 STA &63
260 LDA #6
270 STA &64
280 LDA #0
290 STA &68
300 LDA word
310 STA &69
320 LDA word+1
330 STA &6A
340 JSR sminit
350 .mainloop
360 JSR smnext
370 BCS endoflist
380 LDY #0
390 .compword
400 LDA word+2,Y
410 CMP #13
420 BEQ gotword
430 CMP &632,Y
440 BNE mainloop
450 INY
460 BNE compword
470 .gotword
480 CPY &66
490 BNE endoflist
500 JSR reload
510 LDY #1
520 BNE reload
530 .endoflist
540 LDY #0
550 .reload
560 LDX #&26
570 .loadzero
580 LDA sixty,X
590 STA &60,X
600 DEX
610 BPL loadzero
620 LDA rom
630 STA &F4
640 STA &FE30
650 TYA
660 RTS
670 .rom
680 BRK
690 .sixty
700 EQUS STRING$(40," ")
710 .word
720 EQUS STRING$(32," ")
730 ]NEXT
740 ENDPROC
750 :
760 DEF FNcheck(a$)
770 $word=a$
780 =USR(check)AND&FF
```

Listing 3

```
10 REM >BC-RS
20 REM BBC program to check a word is in RomSpell
30 :
40 DEF FNcheck(a$)
50 $&900="RS "+a$
60 X%=0:Y%=0:CALL &FFF7
70 =?&AF
```

Listing 4

```
10 REM >BP-File
20 REM BBC program to pick a random word from a file
30 :
40 DEF FNpick(file$)
50 file%=OPENIN(file$)
60 ext%=EXT#file%
70 rnd%=RND(ext%)-1
80 PTR#file%=rnd%
90 REPEAT
100 byte%=BGET#file%
110 UNTIL byte%=10 OR EOF#file%
120 IF EOF#file% PTR#file%=0
130 word$=""
140 REPEAT
150 byte%=BGET#file%
160 IF byte%<>10 word$=word$+CHR$byte%
170 UNTIL byte%=10
180 CLOSE#file%
190 =word$
```

Listing 5

```
10 REM >BC-File
20 REM BBC program to check a word is in a file
30 :
40 DEF FNcheck(word$,file$)
50 file%=OPENIN(file$)
60 got=-1
70 ext%=EXT#file%
80 pos%=ext%/2
90 add%=pos%/2
100 old$=""
110 REPEAT
120 new$=FNgetword(pos%)
130 IF new$=old$ got=0
140 IF new$=word$ got=1
150 IF new$>word$ pos%=pos%-add%:add%=add%/2
```

Continued 

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```
160 IF new$<word$ pos%=pos%+add%:add%=
add%/2
170 old$=new$
180 UNTIL got>=0
190 CLOSE #file%
200 =got
210 :
220 DEF FNgetword(pos%)
230 PTR#file%=pos%
240 IF PTR#file%>0 THEN
250   REPEAT
260     byte%=BGET#file%
270     PTR#file%=PTR#file%-2
280   UNTIL PTR#file%=0 OR byte%=10
290   IF byte%=10 PTR#file%=PTR#file%+
2
300 SAVE
310 w$=""
320 REPEAT
330 byte%=BGET#file%
340 IF byte%<>10 w$=w$+CHR$byte%
350 UNTIL byte%=10
360 =w$
```

Listing 6

```
10 REM >AC-SM
20 REM Archimedes program to check a
word is in SpellMaster
30 :
40 DEF FNcheck(a$)
50 LOCAL ERROR
60 ON ERROR LOCAL RESTORE ERROR:VDU 6
:=0
70 VDU 21
80 SYS "OS_CLI","CHECK "+a$
90 VDU 6
100 RESTORE ERROR
110 =1
```

Listing 7

```
10 REM >AP-File
20 REM Archimedes program to pick a w
ord from a file
30 :
40 DEF FNpick(file$)
50 file%=OPENIN(file$)
60 ext%=EXT#file%
70 rnd%=RND(ext%)-1
80 PTR#file%=rnd%
90 REPEAT
100 byte%=BGET#file%
110 UNTIL byte%=10 OR EOF#file%
120 IF EOF#file% PTR#file%=0
130 word$=GET$#file%
140 CLOSE#file%
150 =word$
```

Listing 8

```
10 REM >AC-File
20 REM Archimedes program to check a
word is in a file
30 :
40 DEF FNcheck(word$,file$)
50 file%=OPENIN(file$)
60 got=-1
70 ext%=EXT#file%
80 pos%=ext%/2
90 add%=pos%/2
100 old$=""
110 REPEAT
120 new$=FNgetword(pos%)
130 CASE new$ OF
140   WHEN old$:
150     got=0
160   WHEN word$:
170     got=1
180   OTHERWISE:
190     IF new$>word$ pos%-=add% ELSE
pos%+=add%
200     add%=add%/2
210 ENDCASE
220 old$=new$
230 UNTIL got>=0
240 CLOSE #file%
250 =got
260 :
270 DEF FNgetword(pos%)
280 PTR#file%=pos%
290 IF PTR#file%>0 THEN
300   REPEAT
310     byte%=BGET#file%
320     PTR#file%=PTR#file%-2
330   UNTIL PTR#file%=0 OR byte%=10
340   IF byte%=10 PTR#file%=PTR#file%+
2
350 ENDIF
360 =GET$#file%
```

Listing 9

```
10 REM >WSQG
20 REM By David Lawrence
30 REM For BBC B/B+/M/C/E/A
40 REM (c) BAU January 1990
50 :
60 MODE 4
70 ON ERROR PROCerror:GOTO 120
80 PROCinit
90 PROCscreen
100 PROCcleargrid
110 PROCnowords
120 PROCtidy
130 PROCselect
140 MODE 0
150 *FX 4,0
160 END
170 :
180 DEF PROCerror
190 IF ERR=17 ENDPROC
200 REPORT:PRINT" at line ";ERL
210 END
220 :
230 DEF PROCinit
240 PROCcurs(0)
250 VDU 23,128,0,126,66,66,66,66,126,0
260 VDU 23,129,0,0,0,0,0,0,192,192
270 READ nvar,nopt
280 DIM fn$(nvar),var(nvar),min$(nvar)
,max$(nvar),txt$(nvar)
290 DIM opt$(nopt),d%(7,1),p(4,7),styl
e$(4),words$(40),grid 20*20
300 FOR var=0 TO nvar
310 READ fn$(var),var(var),min$(var),m
ax$(var),txt$(var)
320 NEXT
330 keys$=""
340 FOR opt=1 TO nopt
350 READ opt$(opt)
360 keys$=keys$+CHR$(ASCopt$(opt)-32)
370 NEXT
380 FOR i%=0 TO 7
390 READ d%(i%,0),d%(i%,1)
400 NEXT
410 FOR p%=0 TO 4
420 READ style$(p%)
430 FOR n%=0 TO 7
440 READ p(p%,n%)
450 NEXT
460 NEXT
470 words=0
480 minlen=1
490 maxlen=2
500 entries=3
510 short=4
520 rand=5
530 style=6
540 curvar=0
550 oldvar=1
560 varmod=nvar+1
570 update=TRUE
580 made=FALSE
590 filled=FALSE
600 shown=FALSE
610 done=FALSE
620 *FX4,1
630 ENDPROC
640 :
650 DEF PROCcurs(s)
660 VDU 23;10,255-152*s;0;0;0;0;
670 ENDPROC
680 :
690 DATA 6,7
700 DATA num,20,0,40,"Num Words"
710 DATA num,5,3,var(2),"Min length"
720 DATA num,20,var(1),20,"Max length"
730 DATA num,1,1,40,"Entries"
740 DATA flag,0,0,0,"Short"
750 DATA flag,-1,0,0,"Random fill"
760 DATA style,1,0,4,"Style"
770 :
780 DATA clear,words,edit,make,fill,pr
int,quit
790 :
800 DATA 1,0, 1,-1 ,0,-1, -1,-1, -1,0,
-1,1, 0,1, 1,1
810 :
820 DATA Orthog,1,0,1,0,1,0,1,0
830 DATA Star,1,1,1,1,1,1,1,1
840 DATA Angled,0,1,0,1,0,1,0,1
850 DATA Biased,0.5,1,1,1,1,1,0.5,0.5
860 DATA Dogleg,1,1,1,1,1,1,1,1
870 :
880 DEF PROCnowords
890 FOR i%=0 TO var(words)-1
900 words$(i%)=""
910 NEXT
920 gotwords=FALSE
930 fword=0:oword=0
940 PROClist(fword,oword)
950 ENDPROC
960 :
970 DEF PROCcleargrid
980 FOR x%=0 TO 19
990 FOR y%=0 TO 19
1000 PROCpoke(x%,y%,0)
1010 NEXT
1020 NEXT
1030 made=FALSE
1040 filled=FALSE
1050 ENDPROC
1060 :
1070 DEF PROCpoke(x,y,v)
1080 ?(grid+x+y*20)=v
1090 PROCp(x,y)
1100 ENDPROC
1110 :
1120 DEF PROCp(x,y)
1130 v=FNpeek(x,y)
1140 IF v>127 AND shown v=v-128
1150 IF v=0 OR (v>127 AND NOT shown) v=
128
1160 VDU 31,x+19,y+4,v
1170 ENDPROC
1180 :
1190 DEF FNpeek(x,y)
1200 =?(grid+x+y*20)
1210 :
1220 DEF PROCbox(x1,y2,x2,y1)
1230 MOVE x1*32-8,(31-y2)*32-8
1240 DRAW (x2+1)*32+4,(31-y2)*32-8
1250 DRAW (x2+1)*32+4,(32-y1)*32+4
1260 DRAW x1*32-8,(32-y1)*32+4
1270 DRAW x1*32-8,(31-y2)*32-8
1280 DRAW x1*32-24,(31-y2)*32-24
1290 DRAW (x2+1)*32+20,(31-y2)*32-24
1300 PLOT 1,-16,16:PLOT 0,16,-16
1310 DRAW (x2+1)*32+20,(32-y1)*32+20
1320 PLOT 1,-16,-16:PLOT 0,16,16
1330 DRAW x1*32-24,(32-y1)*32+20
1340 PLOT 1,16,-16:PLOT 0,-16,16
1350 DRAW x1*32-24,(31-y2)*32-24
1360 ENDPROC
1370 :
1380 DEF PROCscreen
1390 PROCbox(1,1,38,1)   :REM title
1400 PROCbox(1,12,16,4)  :REM status
1410 PROCbox(1,23,9,15)  :REM options
1420 PROCbox(19,23,38,4) :REM grid
1430 PROCbox(1,30,13,26) :REM info
1440 PROCbox(16,30,38,26):REM wordlist
1450 COLOUR 129:COLOUR 0
1460 PRINTTAB(1,1);SPC38;TAB(10,1);"Wor
dsquare Generator"
1470 PRINTTAB(1,4);" Current Status "
1480 PRINTTAB(1,15);" Options "
1490 COLOUR 128:COLOUR 1
1500 ENDPROC
1510 :
1520 DEF PROCtidy
1530 FOR var=0 TO nvar
1540 PRINTFNinfo(var,1)
1550 NEXT
1560 FOR opt=1 TO nopt
1570 PRINTFNopt(opt,1)
1580 NEXT
1590 PROClist(fword,oword)
1600 PROCdone
1610 update=TRUE
1620 ENDPROC
1630 :
1640 DEF FNinfo(which,col)
1650 COLOUR col:COLOUR 129-col
1660 =EVAL("FN"+fn$(which)+"("+STR$whic
h+","""+txt$(which)+""")")
1670 :
1680 DEF FNnum(y,text$)
1690 =FNdots(y,text$,RIGHT$("..."+STR$v
ar(y),3))
1700 :
1710 DEF FNflag(y,text$)
1720 IF var(y) ft$="Yes" ELSE ft$=".No"
1730 =FNdots(y,text$,ft$)
1740 :
1750 DEF FNstyle(y,text$)
1760 =FNdots(y,text$,style$(var(y)))
1770 :
1780 DEF FNdots(y,t1$,t2$)
1790 PRINTTAB(1,6+y);t1$;STRING$(16-LEN
t2$-LENt1$,".");t2$
1800 =""
1810 :
1820 DEF FNopt(y,col)
1830 COLOUR col:COLOUR 129-col
1840 PRINTTAB(2,16+y);"[";CHR$(ASCopt$(
y)-32);"]";
1850 COLOUR 1:COLOUR 128
1860 PRINTMID$(opt$(opt),2)
1870 =""
1880 :
1890 DEF PROClist(f,o)
1900 FOR i=0 TO 4
1910 PRINTTAB(17,26+i);
1920 IF i=o COLOUR 129:COLOUR 0:PRINT">
"; ELSE COLOUR 128:COLOUR 1:PRINT" ";
1930 IF f+i<var(words) PRINT words$(f+i
);
1940 PRINT STRING$(38-POS," ")
1950 NEXT
1960 COLOUR 128:COLOUR 1
1970 ENDPROC
1980 :
1990 DEF PROCdoing(s$)
2000 COLOUR 128:COLOUR 1
2010 PRINTTAB(1,28);SPC13;TAB(8-(LENs$/
2),28);s$
2020 ENDPROC
2030 :
2040 DEF PROCdone
2050 COLOUR 128
2060 VDU 28,1,30,13,26,12,26
2070 ENDPROC
2080 :
2090 DEF PROCselect
2100 REPEAT
2110 IF oldvar<>curvar OR update PROCup
date
2120 key$=GET$
2130 IF key$=CHR$138 PROCgodown
2140 IF key$=CHR$139 PROCgoup
2150 IF key$=CHR$136 PROCdec(curvar)
2160 IF key$=CHR$137 PROCinc(curvar)
2170 IF INSTR(keys$,key$) PROCdo(key$)
2180 UNTIL done
2190 ENDPROC
2200 :
2210 DEF PROCgoup
2220 IF NOT INKEY-1 curvar=(curvar+nvar
)MODvarmod:ENDPROC
2230 IF (fword=0 AND oword=0) OR NOT go
twords ENDPROC
2240 IF oword>0 oword=oword-1 ELSE fwor
d=fword-1
2250 PROClist(fword,oword)
2260 ENDPROC
2270 :
2280 DEF PROCgodown
2290 IF NOT INKEY-1 curvar=(curvar+1)MO
Dvarmod:ENDPROC
2300 IF (fword+oword+1=var(words)) OR N
OT gotwords ENDPROC
2310 IF oword<4 oword=oword+1 ELSE fwor
d=fword+1
2320 PROClist(fword,oword)
2330 ENDPROC
2340 :
2350 DEF PROCupdate
2360 IF oldvar<>curvar PRINTFNinfo(oldv
ar,1)
2370 PRINTFNinfo(curvar,0)
2380 oldvar=curvar
2390 update=FALSE
2400 ENDPROC
2410 :
2420 DEF PROCdec(var)
2430 IF var=words AND gotwords ENDPROC
2440 IF fn$(var)="flag" THEN PROCflip(v
ar) ELSE PROCdown(var)
2450 update=TRUE
2460 ENDPROC
2470 :
2480 DEF PROCinc(var)
2490 IF var=words AND gotwords ENDPROC
2500 IF fn$(var)="flag" THEN PROCflip(v
ar) ELSE PROCup(var)
2510 update=TRUE
2520 ENDPROC
2530 :
2540 DEF PROCdown(var)
2550 IF var(var)>EVAL(min$(var)) var(va
r)=var(var)-1
2560 ENDPROC
2570 :
2580 DEF PROCup(var)
2590 IF var(var)<EVAL(max$(var)) var(va
r)=var(var)+1
2600 ENDPROC
2610 :
2620 DEF PROCflip(var)
2630 var(var)=NOT(var(var))
2640 IF var=rand PROCunfill
2650 ENDPROC
2660 :
2670 DEF PROCdo(k$)
2680 opt=INSTR(keys$,key$)
2690 PRINTFNopt(opt,0)
2700 IFEVAL("FN"+opt$(opt))
2710 PRINTFNopt(opt,1)
2720 ENDPROC
2730 :
2740 DEF FNclear
2750 PROCnowords
2760 PROCcleargrid
2770 =0
2780 :
2790 DEF FNwords
2800 IF gotwords VDU 7:=0
2810 fword=0
2820 oword=0
2830 IF var(words)=0 PROCmanual ELSE PR
OCauto
2840 gotwords=TRUE
2850 PROCdone
2860 PROClist(fword,oword)
2870 =0
2880 :
2890 DEF PROCmanual
2900 REPEAT
2910 PROCdoing("Enter word "+LEFT$(STR$
(fword+oword+1)+" ",2))
2920 w$=FNinput(fword,oword)
2930 IF w$<>"" PROCaddword(w$)
```

Continued ▶

WORD GAMES

◀ Continued

```
 294Ø UNTIL w$="" OR fword+oword>39
 295Ø IF fword=Ø oword=oword-1 ELSE fword=fword-1
 296Ø ENDPROC
 297Ø :
 298Ø DEF PROCaddword(w$)
 299Ø words$(fword+oword)=w$
 3ØØØ IF oword<4 oword=oword+1 ELSE fword=fword+1
 3Ø1Ø var(words)=fword+oword
 3Ø2Ø PRINTFNinfo(Ø,-(curvar<>words))
 3Ø3Ø PROClist(fword,oword)
 3Ø4Ø ENDPROC
 3Ø5Ø :
 3Ø6Ø DEF PROCauto
 3Ø7Ø FOR word=Ø TO var(words)-1
 3Ø8Ø PROCdoing("Word "+STR$word)
 3Ø9Ø REPEAT
 31ØØ word$=FNpick : REM *** THIS MAY NEED CHANGING!
 311Ø UNTIL LENword$>=var(minlen) AND LENword$<=var(maxlen)
 312Ø words$(word)=word$
 313Ø IF word<4 PROClist(Ø,word) ELSE PROClist(word-4,4)
 314Ø NEXT
 315Ø PROClist(fword,oword)
 316Ø ENDPROC
 317Ø :
 318Ø DEF FNedit
 319Ø IF NOT gotwords VDU 7:=Ø
 32ØØ words$(fword+oword)=FNinput(fword,oword)
 321Ø =Ø
 322Ø :
 323Ø DEF FNinput(fw,ow)
 324Ø COLOUR Ø:COLOUR 129
 325Ø def$=words$(fw+ow)
 326Ø new$=def$
 327Ø PROCcurs(1)
 328Ø VDU 31,18+LENnew$,26+ow
 329Ø REPEAT
 33ØØ REPEAT
 331Ø k$=GET$
 332Ø IF k$>="A" AND k$<="Z" AND LEN(new$)<2Ø new$=new$+k$:PRINTk$;
 333Ø IF k$=CHR$127 AND new$<>"" new$=LEFT$(new$,LENnew$-1):VDU 127
 334Ø IF k$=CHR$21 OR k$=CHR$9 PRINTSTRING$(LENnew$,CHR$127);:new$=""
 335Ø IF k$=CHR$9 new$=def$:PRINTdef$;
 336Ø UNTIL k$=CHR$13
 337Ø UNTIL (LENnew$>=var(minlen) AND LENnew$<=var(maxlen)) OR new$=""
 338Ø COLOUR 1:COLOUR 128
 339Ø PROCcurs(Ø)
 34ØØ =new$
 341Ø :
 342Ø DEF FNmake
 343Ø IF NOT gotwords VDU 7:=Ø
 344Ø PROCcleargrid
 345Ø PROCdoing("Placing")
 346Ø FOR word=Ø TO var(words)-1
 347Ø IF word<5 PROClist(Ø,word) ELSE PROClist(word-4,4)
 348Ø FOR times=1 TO var(entries)
 349Ø place$=words$(word)
 35ØØ IF times>1 AND var(short) place$=FNtrunc(place$)
 351Ø PROCplace(word,place$)
 352Ø NEXT
 353Ø NEXT
 354Ø PROCdone
 355Ø made=TRUE
 356Ø PROClist(fword,oword)
 357Ø =Ø
 358Ø :
 359Ø DEF FNtrunc(full$)
 36ØØ len=LENfull$
 361Ø rnd=FNrndlen
 362Ø =LEFT$(full$,rnd)
 363Ø :
 364Ø DEF FNrndlen
 365Ø REPEAT
 366Ø rnd=RND(len)
 367Ø UNTIL rnd>1 AND rnd<len
 368Ø =rnd
 369Ø :
 37ØØ DEF PROCplace(w%,p$)
 371Ø len=LENp$
 372Ø REPEAT
 373Ø sx%=RND(2Ø)-1
 374Ø sy%=RND(2Ø)-1
 375Ø REPEAT
 376Ø d1%=RND(8)-1
 377Ø UNTIL p(var(style),d1%)>RND(1)
 378Ø d2%=d1%:cd%=len
 379Ø IF var(style)=4 AND len>2 PROCrnddir
 38ØØ ok=TRUE
 381Ø x%=sx%
 382Ø y%=sy%
 383Ø d%=d1%
 384Ø FOR i%=1 TO len
 385Ø IF i%=cd% d%=d2%
 386Ø ch%=FNpeek(x%,y%)
 387Ø IF ch%>Ø AND ch%<>ASCMID$(p$,i%,1) ok=FALSE
 388Ø x%=x%+d%(d%,Ø)
 389Ø y%=y%+d%(d%,1)
 39ØØ IF x%<Ø OR x%>19 OR y%<Ø OR y%>19 ok=FALSE
 391Ø NEXT
 392Ø UNTIL ok
 393Ø x%=sx%
 394Ø y%=sy%
 395Ø d%=d1%
 396Ø FOR i%=1 TO len
 397Ø IF i%=cd% d%=d2%
 398Ø PROCpoke(x%,y%,ASCMID$(p$,i%,1))
 399Ø x%=x%+d%(d%,Ø)
 4ØØØ y%=y%+d%(d%,1)
 4Ø1Ø NEXT
 4Ø2Ø ENDPROC
 4Ø3Ø :
 4Ø4Ø DEF PROCrnddir
 4Ø5Ø REPEAT
 4Ø6Ø d2%=RND(8)-1
 4Ø7Ø UNTIL ABS(d2%-d1%)<>4 AND d1%<>d2%
 4Ø8Ø cd%=FNrndlen
 4Ø9Ø ENDPROC
 41ØØ :
 411Ø DEF FNfill
 412Ø IF NOT made VDU 7:=Ø
 413Ø IF filled PROCswapshow:=Ø
 414Ø shown=TRUE
 415Ø PROCdoing("Filling")
 416Ø FOR x%=Ø TO 19
 417Ø FOR y%=Ø TO 19
 418Ø IF FNpeek(x%,y%)=Ø PROCpoke(x%,y%,128+FNrandchar)
 419Ø NEXT
 42ØØ NEXT
 421Ø PROCdone
 422Ø filled=TRUE
 423Ø =Ø
 424Ø :
 425Ø DEF PROCunfill
 426Ø IF NOT filled ENDPROC
 427Ø COLOUR 1:COLOUR 128
 428Ø FOR x%=Ø TO 19
 429Ø FOR y%=Ø TO 19
 43ØØ IF FNpeek(x%,y%)>127 PROCpoke(x%,y%,Ø)
 431Ø NEXT
 432Ø NEXT
 433Ø filled=FALSE
 434Ø ENDPROC
 435Ø :
 436Ø DEF PROCswapshow
 437Ø shown=NOT shown
 438Ø COLOUR 1:COLOUR 128
 439Ø FOR x%=Ø TO 19
 44ØØ FOR y%=Ø TO 19
 441Ø PROCp(x%,y%)
 442Ø NEXT
 443Ø NEXT
 444Ø ENDPROC
 445Ø :
 446Ø DEF FNrandchar
 447Ø IF var(rand) THEN =64+RND(26)
 448Ø REPEAT
 449Ø x=RND(2Ø)-1
 45ØØ y=RND(2Ø)-1
 451Ø z=FNpeek(x,y)
 452Ø UNTIL z<>Ø
 453Ø =z AND 127
 454Ø :
 455Ø DEF FNprint
 456Ø IF NOT made VDU 7:=Ø
 457Ø PROCdoing("Printing")
 458Ø tab%=Ø
 459Ø FOR i%=Ø TO 19
 46ØØ IF LENwords$(i%)>tab% tab%=LENwords$(i%)
 461Ø NEXT
 462Ø *FX 3,1Ø
 463Ø VDU 27,48
 464Ø PRINT" +";STRING$(2Ø,"-");"+"
 465Ø FOR y%=Ø TO 19
 466Ø PRINT " |";
 467Ø FOR x%=Ø TO 19
 468Ø c%=FNpeek(x%,y%)
 469Ø IF c%=Ø c%=32
 47ØØ IF c%>127 AND shown c%=c%-128
 471Ø IF c%>127 AND NOT shown c%=32
 472Ø VDU c%
 473Ø NEXT
 474Ø PRINT"|  ";words$(y%);SPC(tab%+2-LENwords$(y%));words$(y%+2Ø)
 475Ø NEXT
 476Ø PRINT" +";STRING$(2Ø,"-");"+"
 477Ø VDU 27,5Ø
 478Ø *FX 3,Ø
 479Ø PROCdone
 48ØØ =Ø
 481Ø :
 482Ø DEF FNquit
 483Ø done=TRUE
 484Ø =Ø
 485Ø :
 486Ø DEF FNpick
 487Ø REM Insert your favourite function here...
 488Ø ="NOTHINGYET"
```

Listing 10

```
   1Ø REM >Wurdz
   2Ø REM By David Lawrence
   3Ø REM For Archimedes only
   4Ø REM (c) BAU January 1989
   5Ø :
   6Ø MODE 12
   7Ø ON ERROR PROCerror:GOTO 1ØØ
   8Ø PROCinit
   9Ø REPEAT
  1ØØ file$=FNinput
  11Ø PROCscan(file$)
  12Ø PROCgenerate
  13Ø UNTIL Ø
  14Ø END
  15Ø :
  16Ø DEF PROCerror
  17Ø IF ERR = 17 THEN
  18Ø   IF INKEY-2 MODE 12:END
  19Ø ELSE
  2ØØ   COLOUR 1
  21Ø   PRINT 'REPORT$;" at line ";ERL
  22Ø ENDIF
  23Ø ENDPROC
  24Ø :
  25Ø DEF PROCinit
  26Ø DIM index 256*4
  27Ø total = HIMEM - END - &8ØØØ
  28Ø DIM mem total
  29Ø SYS "OS_Heap",Ø,mem,,total
  3ØØ :
  31Ø Null = Ø
  32Ø :
  33Ø FOR i% = Ø TO 255 * 4 STEP 4
  34Ø i%!index = Null
  35Ø NEXT
  36Ø :
  37Ø Chain = Ø
  38Ø List  = 4
  39Ø Count = 8
  4ØØ End   = 12
  41Ø Text  = 16
  42Ø :
  43Ø Word  = Ø
  44Ø List  = 4
  45Ø Count = 8
  46Ø :
  47Ø node_size = 12
  48Ø :
  49Ø eow$ = ""
  5ØØ FOR char = Ø TO 32
  51Ø   eow$ += CHR$char
  52Ø NEXT
  53Ø valid$ = ""
  54Ø FOR char = 33 TO 126
  55Ø   valid$ += CHR$char
  56Ø NEXT
  57Ø punc$ = ".?!"
  58Ø :
  59Ø ENDPROC
  6ØØ :
  61Ø DEF FNtalloc(t$,size)
  62Ø txt = FNalloc(size+LENt$+1)
  63Ø $(txt+size) = t$
  64Ø =txt
  65Ø :
  66Ø DEF FNalloc(size)
  67Ø SYS "OS_Heap",2,mem,,size TO ,,_addr
  68Ø IF _addr>Ø THEN =_addr
  69Ø PRINT"Failed to allocate"
  7ØØ END
  71Ø :
  72Ø DEF FNget_char
  73Ø c$ = CHR$BGET#file
  74Ø eow = INSTR(eow$,c$)
  75Ø valid = INSTR(valid$,c$)
  76Ø = c$
  77Ø :
  78Ø DEF FNget_word(file)
  79Ø REPEAT
  8ØØ   word$ = FNget_char
  81Ø UNTIL ((NOT eow) AND valid) OR EOF#file
  82Ø IF (NOT eow) AND (NOT EOF#file) THEN
  83Ø   REPEAT
  84Ø     REPEAT
  85Ø       char$ = FNget_char
  86Ø     UNTIL eow OR valid OR EOF#file
  87Ø     IF valid word$ += char$
  88Ø   UNTIL eow OR EOF#file
  89Ø ENDIF
  9ØØ = word$
  91Ø :
  92Ø DEF FNfind_word(word$,RETURN found)
  93Ø addr  = index!(4*ASCword$)
  94Ø ans   = FALSE
  95Ø done  = FALSE
  96Ø after = Null
  97Ø found = Null
  98Ø WHILE (addr <> Null) AND (NOT done)
  99Ø   this$ = $(addr + Text)
 1ØØØ   IF word$ = this$ THEN
 1Ø1Ø     found = addr
 1Ø2Ø     ans   = TRUE
 1Ø3Ø     done  = TRUE
 1Ø4Ø   ELSE
 1Ø5Ø     IF word$ < this$ THEN
 1Ø6Ø       found = after
 1Ø7Ø       ans   = FALSE
 1Ø8Ø       done  = TRUE
 1Ø9Ø     ELSE
 11ØØ       after = addr
 111Ø       addr = addr!Chain
 112Ø     ENDIF
 113Ø   ENDIF
 114Ø ENDWHILE
 115Ø = ans
 116Ø :
 117Ø DEF FNadd_word(word$,after)
 118Ø ptr = FNtalloc(word$,Text)
 119Ø ptr!List  = Null
 12ØØ ptr!Count = Ø
 121Ø ptr!End   = Null
 122Ø IF after = Null THEN
 123Ø   ptr!Chain = index!(4*ASCword$)
 124Ø   index!(4*ASCword$) = ptr
 125Ø ELSE
 126Ø   ptr!Chain = after!Chain
 127Ø   after!Chain = ptr
 128Ø ENDIF
 129Ø = ptr
 13ØØ :
 131Ø DEF FNfind_node(start,match)
 132Ø found = Null
 133Ø WHILE (start <> Null) AND (found = Null)
 134Ø   IF start!Word = match THEN
 135Ø     found = start
 136Ø   ELSE
 137Ø     start = start!List
 138Ø   ENDIF
 139Ø ENDWHILE
 14ØØ = found
 141Ø :
 142Ø DEF FNadd_node(word,addr)
 143Ø ptr = FNalloc(node_size)
 144Ø ptr!Word  = addr
 145Ø ptr!List  = Null
 146Ø ptr!Count = 1
 147Ø last = word!End
 148Ø IF last <> Null THEN
 149Ø   last!List = ptr
 15ØØ ELSE
 151Ø   word!List = ptr
 152Ø ENDIF
 153Ø word!End = ptr
 154Ø = ptr
 155Ø :
 156Ø DEF FNinput
 157Ø COLOUR 6
 158Ø PRINT''"Enter file to scan"'" > ";
 159Ø COLOUR 2
 16ØØ INPUT ""file$
 161Ø =file$
 162Ø :
 163Ø DEF PROCscan(file$)
 164Ø file = OPENIN(file$)
 165Ø prev = Null
 166Ø REPEAT
 167Ø word$ = FNget_word(file)
 168Ø got = FNfind_word(word$,this)
 169Ø got = FNfind_word(word$,this)
 17ØØ IF got THEN
 171Ø   COLOUR 7
 172Ø ELSE
 173Ø   COLOUR 2
 174Ø   this = FNadd_word(word$,this)
 175Ø ENDIF
 176Ø PROCprint(word$)
 177Ø IF prev <> Null THEN
 178Ø   prev!Count += 1
 179Ø   node = FNfind_node(prev!List,this)
 18ØØ   IF node = Null THEN
 181Ø     node = FNadd_node(prev,this)
 182Ø   ELSE
 183Ø     node!Count += 1
 184Ø   ENDIF
 185Ø ENDIF
 186Ø prev = this
 187Ø UNTIL EOF#file
 188Ø CLOSE #file
 189Ø COLOUR 1
 19ØØ PRINT''"-----"'
 191Ø COLOUR 7
 192Ø ENDPROC
 193Ø :
 194Ø DEF PROCprint(word$)
 195Ø len = LENword$
 196Ø IF POS + len > 76 PRINT
 197Ø PRINT word$;" ";
 198Ø IF INSTR(punc$,RIGHT$(word$,1)) PRINT'
 199Ø ENDPROC
```

Continued ▶

WORD GAMES

◀ Continued

```
2ØØØ :
2Ø1Ø DEF FNrandom
2Ø2Ø REPEAT
2Ø3Ø   let = 31 + RND(256 - 32)
2Ø4Ø   addr = index!(let * 4)
2Ø5Ø UNTIL addr <> Null
2Ø6Ø = addr
2Ø7Ø :
2Ø8Ø DEF PROCgenerate
2Ø9Ø word = FNrandom
21ØØ REPEAT
211Ø   PROCprint($(word+Text))
212Ø   count = word!Count
213Ø   IF count = Ø THEN
214Ø     word = FNrandom
215Ø   ELSE
216Ø     IF count = 1 THEN
217Ø       rnd = 1
218Ø     ELSE
219Ø       rnd = RND(count)
22ØØ     ENDIF
221Ø     i = Ø
222Ø     ptr = word
223Ø     REPEAT
224Ø       ptr = ptr!List
225Ø       i += ptr!Count
226Ø     UNTIL i >= rnd
227Ø     word = ptr!Word
228Ø   ENDIF
229Ø UNTIL FALSE
23ØØ ENDPROC
```

```
   1Ø REM >Anagram 1.Ø5
   2Ø REM By David Lawrence
   3Ø REM For Archimedes only
   4Ø REM (c) BAU January 199Ø
   5Ø :
   6Ø SYS "XOS_CLI","Copy <Obey$Dir>.Nam
es RAM:Names F~C~V"
   7Ø SYS "XOS_CLI","Copy <Obey$Dir>.Mai
n RAM:Main F~C~V"
   8Ø :
   9Ø MODE 12
  1ØØ PROCinit
  11Ø PROCcode
  12Ø REPEAT
  13Ø   REPEAT
  14Ø     com$=FNinput
  15Ø     act=ASC(com$)-128
  16Ø   UNTIL act>Ø
  17Ø   com$=MID$(com$,2)
  18Ø   IF EVAL("FN"+fn$(act))
  19Ø   IF (bits(act) AND 1) scan=1
  2ØØ   IF (bits(act) AND 2) stored=FALS
E
  21Ø UNTIL done
  22Ø MODE 12
  23Ø *FX 229,Ø
  24Ø *FX 4,Ø
  25Ø END
  26Ø :
  27Ø DEF PROCinit
  28Ø *FX 229 1
  29Ø *FX 4,1
  3ØØ READ coms
  31Ø DIM com$(coms),par(coms),fn$(coms)
,help$(coms),bits(coms)
  32Ø DIM qual$(4),len(4),min(4),val$(4)
,dic$(1ØØ),dic(1ØØ)
  33Ø YN$="YN"
  34Ø NUM$="Ø123456789"
  35Ø ALL$=""
  36Ø FOR I%=32 TO 126
  37Ø ALL$+=CHR$I%
  38Ø NEXT
  39Ø icom$=""
  4ØØ FOR I%=1 TO coms
  41Ø READ com$(I%),par(I%),bits(I%),fn$
(I%),help$(I%)
  42Ø icom$+=LEFT$(com$(I%),1)
  43Ø NEXT
  44Ø FOR I%=Ø TO 4
  45Ø READ qual$(I%),len(I%),min(I%),val
$(I%)
  46Ø NEXT
  47Ø stored=FALSE
  48Ø scan=TRUE
  49Ø mono=FALSE
  5ØØ SYS "OS_ReadModeVariable",MODE,1 T
O ,,scr_width
  51Ø scr_width+=1
  52Ø SYS "OS_ReadModeVariable",MODE,3 T
O ,,maxlogcol
  53Ø IF maxlogcol=1 mono=TRUE
  54Ø max=2
  55Ø in$=""
  56Ø out$=""
  57Ø dics=Ø
  58Ø IFFNdic("Names")
  59Ø IFFNdic("Main")
  6ØØ cols=Ø
  61Ø done=FALSE
  62Ø COLOUR 13,&8Ø,&CØ,&FØ
  63Ø COLOUR 14,&ØØ,&FØ,&8Ø
  64Ø COLOUR 15,&FØ,&8Ø,&ØØ
  65Ø IF NOT mono COLOUR 6
  66Ø PRINT"  Type 'Help' for help."'
  67Ø ENDPROC
  68Ø :
  69Ø DEF FNinput
  7ØØ IF NOT mono COLOUR 2 ELSE COLOUR 7
  71Ø PRINT"] ";
  72Ø IF NOT mono COLOUR 5
  73Ø s$=""
  74Ø len=Ø
  75Ø REPEAT
  76Ø   k=GET
  77Ø   IF k=127 PROCdel
  78Ø   IF k>31 AND k<127 PROCchar
  79Ø   IF k=13 THEN
  8ØØ     sub=ASC(s$)-128
  81Ø     IF sub>Ø THEN
  82Ø       type=par(sub)
  83Ø       IF len<min(type) k=Ø
  84Ø     ENDIF
  85Ø   ENDIF
  86Ø UNTIL k=13
  87Ø PRINT
  88Ø =s$
  89Ø :
  9ØØ DEF PROCdel
  91Ø IF len=Ø VDU 7:ENDPROC
  92Ø sub=ASC(s$)-128
  93Ø IF sub>Ø THEN
  94Ø   IF len=1 THEN
  95Ø     WHILE POS>3
  96Ø       VDU 127
  97Ø     ENDWHILE
  98Ø   ELSE
  99Ø     IF len=2 THEN
 1ØØØ       IF par(sub)=1 THEN
 1Ø1Ø         CASE RIGHT$(s$) OF
 1Ø2Ø           WHEN "N" : VDU 127
 1Ø3Ø           WHEN "Y" : VDU 127,127
 1Ø4Ø         ENDCASE
 1Ø5Ø       ENDIF
 1Ø6Ø     ENDIF
 1Ø7Ø   ENDIF
 1Ø8Ø ENDIF
 1Ø9Ø s$=LEFT$(s$)
 11ØØ VDU 127
 111Ø len-=1
 112Ø ENDPROC
 113Ø :
 114Ø DEF PROCchar
 115Ø IF len=Ø THEN
 116Ø   com=INSTR(icom$,CHR$k)
 117Ø   IF com<>Ø THEN
 118Ø     s$+=CHR$(com+128)
 119Ø     PRINT com$(com);
 12ØØ     IF k<>42 VDU 32
 121Ø     len+=1
 122Ø   ENDIF
 123Ø ELSE
 124Ø   type=par(ASC(s$)-128)
 125Ø   IF len<>len(type) THEN
 126Ø     k$=CHR$k
 127Ø     IF INSTR(EVAL(val$(type)),k$)
THEN
 128Ø       s$+=k$
 129Ø       len+=1
 13ØØ       VDU k
 131Ø       IF len=2 AND type=1 THEN
 132Ø         IF k=ASC"Y" PRINT"es";
 133Ø         IF k=ASC"N" PRINT"o";
 134Ø       ENDIF
 135Ø     ENDIF
 136Ø   ENDIF
 137Ø ENDIF
 138Ø ENDPROC
 139Ø :
 14ØØ DEF PROCerr(err$)
 141Ø IF NOT mono COLOUR 1
 142Ø PRINT'"  ";err$
 143Ø ENDPROC
 144Ø :
 145Ø DEF FNnull
 146Ø done=TRUE
 147Ø =Ø
 148Ø :
 149Ø DEF FNhelp
 15ØØ FOR I%=1 TO coms
 151Ø IF NOT mono COLOUR 7
 152Ø PRINT"  ";com$(I%);" ";
 153Ø IF NOT mono COLOUR 3
 154Ø PRINTqual$(par(I%));TAB(24);
 155Ø IF NOT mono COLOUR 6
 156Ø PRINT help$(I%)
 157Ø NEXT
 158Ø =Ø
 159Ø :
 16ØØ DEF FNstatus
 161Ø PROCshow("Input word",in$<>"",CHR$
34+in$+CHR$34,"(None)")
 162Ø PROCprint("Maximum length",STR$max
)
 163Ø d$="Dictionaries"
 164Ø CASE dics OF
 165Ø   WHEN Ø :
 166Ø     PROCprint(d$,"(none)")
 167Ø   OTHERWISE :
 168Ø     IF dics=1 d$="Dictionary"
 169Ø     tot=Ø
 17ØØ     FOR I%=1 TO dics
 171Ø       IF NOT mono COLOUR 6
 172Ø       PRINT"  ";d$;TAB(15);
 173Ø       IF NOT mono COLOUR 3
 174Ø       PRINTRIGHT$("   "+STR$I%,2);
 175Ø       IF NOT mono COLOUR 6
 176Ø       VDU 32,58,32
 177Ø       IF NOT mono COLOUR 3
 178Ø       PRINT"""";dic$(I%);"""";
 179Ø       IF scan=Ø THEN
 18ØØ         PRINT" (";dic(I%);")";
 181Ø         tot+=dic(I%)
 182Ø       ENDIF
 183Ø       PRINT
 184Ø       d$=""
 185Ø     NEXT
 186Ø ENDCASE
 187Ø IF scan=Ø THEN
 188Ø   PROCprint("Total words",STR$tot)
 189Ø ENDIF
 19ØØ IF stored THEN
 191Ø   PROCprint("Total anagrams",STR$a
nags)
 192Ø ENDIF
 193Ø PROCshow("Output columns",cols=Ø,"
'Full width'",STR$cols)
 194Ø PROCshow("Output file",out$<>"",CH
R$34+out$+CHR$34,"(None)")
 195Ø PROCshow("Monochrome",mono,"Yes","
No")
 196Ø IF scan=Ø THEN
 197Ø   spare=!_wptr-!_dptr
 198Ø   PROCprint("Memory used",FNcomma(
free-spare))
 199Ø   PROCprint("Memory free",FNcomma(
spare))
 2ØØØ ENDIF
 2Ø1Ø =Ø
 2Ø2Ø :
 2Ø3Ø DEF FNcomma(num)
 2Ø4Ø num$=STR$num
 2Ø5Ø pad$=""
 2Ø6Ø FOR I%=1 TO LEN(num$)
 2Ø7Ø pad$=RIGHT$(num$)+pad$
 2Ø8Ø num$=LEFT$(num$)
 2Ø9Ø IF (I% MOD 3=Ø) AND num$<>"" pad$=
","+pad$
 21ØØ NEXT
 211Ø =pad$
 212Ø :
 213Ø DEF PROCprint(str$,set$)
 214Ø IF NOT mono COLOUR 6
 215Ø PRINT"  ";str$;TAB(18);": ";
 216Ø IF NOT mono COLOUR 3
 217Ø IF set$<>"" PRINTset$
 218Ø ENDPROC
 219Ø :
 22ØØ DEF PROCshow(str$,true,t$,f$)
 221Ø IF true THEN
 222Ø   PROCprint(str$,t$)
 223Ø ELSE
 224Ø   PROCprint(str$,f$)
 225Ø ENDIF
 226Ø ENDPROC
 227Ø :
 228Ø DEF FNnum(min,com$,RETURN num)
 229Ø new=VAL(com$)
 23ØØ IF new<min OR new>255 THEN
 231Ø   PROCerr("'"+com$+"' is out of ra
nge")
 232Ø ELSE
 233Ø   num=new
 234Ø ENDIF
 235Ø =Ø
 236Ø :
 237Ø DEF FNstr(com$,RETURN str$)
 238Ø str$=com$
 239Ø =Ø
 24ØØ :
 241Ø DEF FNflag(com$,RETURN flag)
 242Ø CASE com$ OF
 243Ø   WHEN "Y" : flag = TRUE
 244Ø   WHEN "N" : flag = FALSE
 245Ø ENDCASE
 246Ø =Ø
 247Ø :
 248Ø DEF FNdic(com$)
 249Ø IF INSTR(com$,":") THEN
 25ØØ   SYS "OS_File",5,com$ TO objtype,
,ftype
 251Ø ELSE
 252Ø   SYS "OS_File",5,"Ram:"+com$ TO o
bjtype,,ftype
 253Ø   IF objtype=1 THEN
 254Ø     com$="Ram:"+com$
 255Ø   ELSE
 256Ø     SYS "OS_File",5,com$ TO objtyp
e,,ftype
 257Ø   ENDIF
 258Ø ENDIF
 259Ø CASE objtype OF
 26ØØ   WHEN Ø :
 261Ø     PROCerr("Dictionary '"+com$+"'
 not found")
 262Ø   WHEN 2 :
 263Ø     PROCerr("'"+com$+"' is a direc
tory")
 264Ø   WHEN 1 :
 265Ø     IF ((ftype>>8)AND&FFF)<>&D1C T
HEN
 266Ø       PROCerr("'"+com$+"' is not a
 recognised as a dictionary")
 267Ø     ELSE
 268Ø       dics+=1
 269Ø       dic$(dics)=com$
 27ØØ     ENDIF
 271Ø ENDCASE
 272Ø =Ø
 273Ø :
 274Ø DEF FNremove(com$)
 275Ø IF dics=Ø THEN
 276Ø   PROCerr("No dictionaries loaded"
)
 277Ø ELSE
 278Ø   rem=VAL(com$)
 279Ø   IF rem<1 OR rem>dics THEN
 28ØØ     PROCerr("'"+com$+"' is out of
range")
 281Ø   ELSE
 282Ø     I%=rem+1
 283Ø     REPEAT
 284Ø       dic$(I%-1)=dic$(I%)
 285Ø       I%+=1
 286Ø     UNTIL I%>dics
 287Ø     dics-=1
 288Ø   ENDIF
 289Ø ENDIF
 29ØØ =Ø
 291Ø :
 292Ø DEF FNoscli(com$)
 293Ø IF NOT mono COLOUR 7
 294Ø OSCLI(com$)
 295Ø =Ø
 296Ø :
 297Ø DEF FNgo
 298Ø IF dics=Ø THEN
 299Ø   PROCerr("No dictionaries loaded"
)
 3ØØØ ELSE
 3Ø1Ø   IF in$="" THEN
 3Ø2Ø     PROCerr("No input word")
 3Ø3Ø   ELSE
 3Ø4Ø     IF out$="" THEN
 3Ø5Ø       ?outfile=Ø
 3Ø6Ø     ELSE
 3Ø7Ø       ?outfile=OPENOUT(out$)
 3Ø8Ø     ENDIF
 3Ø9Ø     $word=FNconv(in$)
 31ØØ     CALL init
 311Ø     IF scan THEN
 312Ø       !_wptr=!_wptr_
 313Ø       !_dptr=!_dptr_
 314Ø       IF NOT mono COLOUR 6
 315Ø       PRINT"  Generating word list
: ";
 316Ø       OFF
 317Ø       IF NOT mono COLOUR 7
 318Ø       I%=1
 319Ø       error=FALSE
 32ØØ       sum=Ø
 321Ø       REPEAT
 322Ø         B%=OPENIN(dic$(I%))
 323Ø         numb=USR(search)
 324Ø         *FX 229 1
 325Ø         dic(I%)=numb
 326Ø         sum+=numb
 327Ø         CLOSE #B%
 328Ø         I%+=1
 329Ø       UNTIL I%>dics OR numb=-1
 33ØØ       PRINT
 331Ø       ON
 332Ø     ENDIF
 333Ø     IF sum=Ø THEN
 334Ø       PROCerr("No words found")
 335Ø     ELSE
 336Ø       IF numb<>-1 THEN
 337Ø         scan=FALSE
 338Ø         IF NOT mono COLOUR 6
 339Ø         PRINT"  Anagrams found:"'
 34ØØ         IF NOT mono COLOUR 7
 341Ø         A%=max
 342Ø         ?_colflag=NOT mono
 343Ø         ?_howmany=cols
 344Ø         anags=USR(anagram)
 345Ø         *FX 229 1
 346Ø         IF anags<>-1 THEN
 347Ø           stored=TRUE
 348Ø         ENDIF
 349Ø         IF anags=Ø THEN
 35ØØ           PROCerr("None found")
 351Ø         ENDIF
 352Ø       ENDIF
 353Ø     ENDIF
 354Ø     CLOSE #Ø
 355Ø   ENDIF
 356Ø ENDIF
 357Ø =Ø
 358Ø :
 359Ø DEF FNconv(old$)
 36ØØ new$=""
```

Continued ▶

WORD GAMES

◀ Continued

```
3610 FOR I%=1 TO LEN(old$)
3620   a$=MID$(old$,I%,1)
3630   IF (a$>="A" AND a$<="Z") OR (a$>="a" AND a$<="z") THEN
3640     new$+=CHR$(ASC(a$)AND&DF)
3650   ENDIF
3660 NEXT
3670 =new$
3680 :
3690 DEF PROCcode
3700 char=0
3710 file=1
3720 len=2
3730 addr=3
3740 base=4
3750 count=5
3760 poke=5
3770 total=6
3780 dptr=7
3790 wptr=8
3800 ord=9
3810 peek=9
3820 ocs=10
3830 from=10
3840 word1=11
3850 word2=12
3860 :
3870 char=0
3880 old=1
3890 new=2
3900 get=3
3910 put=4
3920 chs=5
3930 or=6
3940 wsp=7
3950 dsp=8
3960 original=9
3970 dataend=10
3980 current=11
3990 depth=12
4000 :
4010 sp=13
4020 link=14
4030 pc=15
4040 length=26
4050 buf=1024
4060 :
4070 DIM word 255,code 2000,wstack 128,dstack 1024,block buf
4080 free=HIMEM-END-&8000
4090 :
4100 DIM start free
4110 end=start+free-1
4120 FOR pass%=0 TO 2 STEP 2:P%=code
4130 [OPT pass%
4140 .analyse
4150 STMFD (sp)!,{char,len,base,count,addr,link}
4160 MOV len,#0
4170 ]
4180 FOR loop=0 TO 6
4190 [OPT pass%
4200 STR len,[base,#(loop*4)]
4210 ]NEXT
4220 [OPT pass%
4230 LDR addr,wordp
4240 .freq
4250 LDRB char,[addr],#1
4260 CMP char,#13
4270 BEQ eos
4280 ADD len,len,#1
4290 SUBS char,char,#ASC"A"
4300 CMP char,#26
4310 BCS freq
4320 LDRB count,[base,char]
4330 ADD count,count,#1
4340 STRB count,[base,char]
4350 B freq
4360 .eos
4370 STRB len,[base,#length]
4380 STRB len,_len
4390 LDMFD (sp)!,{char,len,base,count,addr,pc}
4400 :
4410 .sescape
4420 MOV R0,#126
4430 SWI "OS_Byte"
4440 SWI "OS_WriteS"
4450 EQUB 17:EQUB 1:EQUB 13:EQUB 10
4460 EQUS "  Search terminated"
4470 EQUB 13:EQUB 10:EQUB 0
4480 ALIGN
4490 MVN R0,#0
4500 LDMFD (sp)!,{pc}
4510 :
4520 .search
4530 STMFD (sp)!,{link}
4540 STMFD (sp)!,{R0-R2}
4550 MOV R0,#229
4560 MOV R1,#0
4570 MOV R2,#0
4580 SWI "OS_Byte"
4590 LDMFD (sp)!,{R0-R2}
4600 MOV total,#0
4610 LDR dptr,_dptr
4620 LDR wptr,_wptr
4630 ADR base,lets
4640 MOV R3,#1
4650 .nextword
4660 SWI "OS_ReadEscapeState"
4670 BCS sescape
4680 MOV len,#0
4690 ]
4700 FOR loop=0 TO 24 STEP 4
4710 [OPT pass%
4720 STR len,[dptr,#loop]
4730 ]NEXT
4740 [OPT pass%
4750 LDR poke,wordp
4760 .byteloop
4770 SUBS R3,R3,#1
4780 BLEQ loadblock
4790 .noload
4800 LDRB char,[peek],#1
4810 STRB char,[poke],#1
4820 CMP char,#ASC"a"
4830 SUBGE char,char,#32
4840 CMP char,#13
4850 BEQ gotword
4860 SUBS char,char,#ASC"A"
4870 CMP char,#26
4880 BCS byteloop
4890 ADD len,len,#1
4900 LDRB word1,[dptr,char]
4910 LDRB word2,[base,char]
4920 ADD word1,word1,#1
4930 CMP word1,word2
4940 BGT noway
4950 STRB word1,[dptr,char]
4960 B byteloop
4970 .gotword
4980 STRB len,[dptr,#length]
4990 ADD total,total,#1
5000 ADD dptr,dptr,#28
5010 MOV char,#0
5020 LDR word1,wordp
5030 SUB poke,poke,#1
5040 .stword
5050 STRB char,[wptr],#-1
5060 LDRB char,[poke,#-1]!
5070 CMP poke,word1
5080 BGE stword
5090 ADD char,wptr,#1
5100 STR char,[dptr],#4
5110 AND char,total,#%11000
5120 ADD PC,PC,char,LSL #1
5130 EQUS "Blob"
5140 SWI "OS_WriteS"
5150 EQUS "*...":EQUD 0
5160 B stared
5170 SWI "OS_WriteS"
5180 EQUS ".*..":EQUD 0
5190 B stared
5200 SWI "OS_WriteS"
5210 EQUS "..*.":EQUD 0
5220 B stared
5230 SWI "OS_WriteS"
5240 EQUS "...*":EQUD 0
5250 B stared
5260 .stared
5270 SWI "OS_WriteS"
5280 EQUD &08080808:EQUD 0
5290 .nostars
5300 CMP dptr,wptr
5310 BCC nextword
5320 SWI "OS_WriteS"
5330 EQUB 17:EQUB 1:EQUB 13:EQUB 10
5340 EQUS "  Out of memory"
5350 EQUB 13:EQUB 10:EQUB 0
5360 ALIGN
5370 MVN R0,#0
5380 LDMFD (sp)!,{pc}
5390 .noway
5400 SUBS R3,R3,#1
5410 BLEQ loadblock
5420 LDRB char,[peek],#1
5430 CMP char,#13
5440 BNE noway
5450 B nextword
5460 :
5470 .loadblock
5480 STMFD (sp)!,{len,base}
5490 MOV R0,#4
5500 LDR R2,_block
5510 MOV R3,#buf
5520 SWI "OS_GBPB"
5530 LDMFD (sp)!,{len,base}
5540 RSBS R3,R3,#buf
5550 BEQ eof
5560 LDR peek,_block
5570 MOV pc,link
5580 .eof
5590 STR wptr,_wptr
5600 STR dptr,_dptr
5610 MOV R0,total
5620 LDMFD (sp)!,{pc}
5630 :
5640 .lets
5650 EQUS STRING$(28,CHR$0)
5660 .comp
5670 EQUS STRING$(28,CHR$0)
5680 .wordp
5690 EQUD word
5700 ._dptr
5710 EQUD start
5720 ._wptr
5730 EQUD end
5740 ._len
5750 EQUD 0
5760 ._dsp
5770 EQUD dstack
5780 ._wsp
5790 EQUD wstack
5800 ._block
5810 EQUD block
5820 :
5830 ._dptr_
5840 EQUD start
5850 ._wptr_
5860 EQUD end
5870 :
5880 .init
5890 STMFD (sp)!,{link}
5900 ADR base,lets
5910 BL analyse
5920 MOV count,#0
5930 MOV ocs,#0
5940 ADR base,lets
5950 ADR ord,check+25*16
5960 .again
5970 MOV addr,#25
5980 .which
5990 LDRB char,[base,addr]
6000 CMP char,ocs
6010 BNE isnt
6020 STRB addr,[ord,#0]
6030 STRB addr,[ord,#4]
6040 SUB ord,ord,#16
6050 ADD count,count,#1
6060 .isnt
6070 SUBS addr,addr,#1
6080 BPL which
6090 ADD ocs,ocs,#1
6100 CMP count,#26
6110 BNE again
6120 LDMFD (sp)!,{pc}
6130 :
6140 ._found
6150 EQUD 0
6160 ._howlong
6170 EQUD 0
6180 :
6190 .anagram
6200 LDR current,_dptr_
6210 LDR dataend,_dptr
6220 LDR wsp,_wsp
6230 LDR dsp,_dsp
6240 ADR original,lets
6250 SUB depth,R0,#1
6260 LDRB R0,[original,#length]
6270 ADD R0,R0,depth
6280 ADD R0,R0,#4
6290 STR R0,_howlong
6300 MOV R0,#229
6310 MOV R1,#0
6320 MOV R2,#0
6330 STR R1,_found
6340 SWI "OS_Byte"
6350 LDR R0,_howmany
6360 CMP R0,#0
6370 BNE strcols
6380 LDR R1,_howlong
6390 MOV R2,#(scr_width-2)
6400 .stupid
6410 SUBS R2,R2,R1
6420 ADDPL R0,R0,#1
6430 BPL stupid
6440 STR R0,_howmany
6450 .strcols
6460 STR R0,_count
6470 LDR R0,magic
6480 STMFD (sp)!,{R0,link}
6490 BL anag
6500 LDR R0,_found
6510 CMP R0,#0
6520 SWINE "OS_NewLine"
6530 SWIEQ 256+11
6540 LDMFD (sp)!,{R1,pc}
6550 :
6560 .magic
6570 EQUS "dL89"
6580 :
6590 .escape
6600 MOV R0,#126
6610 SWI "OS_Byte"
6620 LDR R0,magic
6630 .recover
6640 LDMFD (sp)!,{R1}
6650 CMP R0,R1
6660 BNE recover
6670 SWI "OS_WriteS"
6680 EQUB 17:EQUB 1:EQUB 13:EQUB 10
6690 EQUS "  Search terminated"
6700 EQUB 13:EQUB 10:EQUB 0
6710 ALIGN
6720 MVN R0,#0
6730 LDMFD (sp)!,{pc}
6740 :
6750 .anag
6760 STMFD (sp)!,{current,link}
6770 SWI "OS_ReadEscapeState"
6780 BCS escape
6790 .findone
6800 LDRB old,[original,#length]
6810 LDRB new,[current,#length]
6820 CMP new,old
6830 BGT nextone
6840 CMP depth,#0
6850 BNE check
6860 CMP new,old
6870 BNE nextone
6880 .check
6890 ]
6900 FOR byte=1 TO 26
6910 [OPT pass%
6920 LDRB old,[original,#26]
6930 LDRB new,[current,#26]
6940 CMP new,old
6950 BGT nextone
6960 ]
6970 NEXT
6980 [OPT pass%
6990 LDRB old,[original,#length]
7000 LDRB new,[current,#length]
7010 CMP new,old
7020 BEQ print
7030 SUB depth,depth,#1
7040 ]
7050 FOR off=0 TO 24 STEP 4
7060 [OPT pass%
7070 LDR old,[original,#off]
7080 STMIA (dsp)!,{old}
7090 LDR new,[current,#off]
7100 SUB new,old,new
7110 STR new,[original,#off]
7120 ]NEXT
7130 [OPT pass%
7140 LDR old,[current,#28]
7150 STMIA (wsp)!,{old}
7160 BL anag
7170 SUB wsp,wsp,#4
7180 LDMDB (dsp)!,{R0-R6}
7190 STMIA (original),{R0-R6}
7200 ADD depth,depth,#1
7210 .nextone
7220 ADD current,current,#32
7230 CMP current,dataend
7240 BNE findone
7250 LDMFD (sp)!,{current,pc}
7260 :
7270 ._colflag
7280 EQUD 0
7290 ._howmany
7300 EQUD 0
7310 ._count
7320 EQUD 0
7330 :
7340 .print
7350 SWI 256+17
7360 LDR new,_wsp
7370 MOV chs,#0
7380 LDR char,_colflag
7390 CMP char,#0
7400 BEQ nocol
7410 SUB char,wsp,new
7420 MOV char,char,LSR #2
7430 RSB char,char,#15
7440 .nocol
7450 CMP char,#13
7460 MOVCC char,#7
7470 SWI "OS_WriteC"
7480 ADR put,buffer
7490 .moveloop
7500 CMP new,wsp
7510 BEQ movelast
7520 LDR get,[new],#4
7530 .moveword
7540 ADD chs,chs,#1
7550 LDRB char,[get],#1
7560 CMP char,#0
7570 MOVEQ char,#32
7580 STRB char,[put],#1
7590 BNE moveword
7600 B moveloop
7610 .movelast
7620 LDR get,[current,#28]
7630 .lastloop
7640 ADD chs,chs,#1
7650 LDRB char,[get],#1
7660 CMP char,#0
7670 STRB char,[put],#1
7680 CMP char,#0
7690 BNE lastloop
7700 LDR R0,_found
7710 ADD R0,R0,#1
7720 STR R0,_found
7730 SWI 256+32
7740 SWI 256+32
7750 ADR R0,buffer
7760 SWI "OS_Write0"
7770 LDRB R1,outfile
7780 CMP R1,#0
7790 BEQ nofile
7800 ADR get,buffer
7810 .writeout
7820 LDRB char,[get],#1
7830 CMP char,#0
```

Continued ▶

WORD GAMES

◀ Continued

```
7840 SWINE "OS_BPut"
7850 BNE writeout
7860 MOV char,#10
7870 SWI "OS_BPut"
7880 .nofile
7890 LDR char,_count
7900 SUBS char,char,#1
7910 LDREQ char,_howmany
7920 SWIEQ "OS_NewLine"
7930 STR char,_count
7940 BEQ nextone
7950 LDR char,_howlong
7960 SUB R1,char,chs
7970 SUB R1,R1,#1
7980 ADR R0,spaces
7990 SWI "OS_WriteN"
8000 B nextone
8010 :
8020 .outfile
8030 EQUD 0
8040 :
8050 .spaces
8060 EQUS "         "
8070 .buffer
8080 :
8090 ]NEXT
8100 ENDPROC
8110 :
8120 DATA 12
8130 DATA Anagram,    3,%11,"str(com$,i
n$)"
8140 DATA "Set the word to be 'anagrami
sed'"
8150 DATA Columns,    4,%00,"num(0,com$
,cols)"
8160 DATA "Set the number of output col
umns or 0 for 'full width'"
8170 DATA Dictionary, 2,%11,"dic(com$)"
8180 DATA "Add the named dictionary to
those searched"
8190 DATA File,       3,%00,"str(com$,o
ut$)"
8200 DATA "Direct output from program t
o named file"
8210 DATA Go,         0,%00,"go"
8220 DATA "Start the anagram finder"
8230 DATA Help,       0,%00,"help"
8240 DATA "Display this text"
8250 DATA Monochrome, 1,%00,"flag(com$,
mono)"
8260 DATA "Switches all subsequent outp
ut into black and white"
8270 DATA Quit,       0,%00,"null"
8280 DATA "Quit the program"
8290 DATA Remove,     4,%11,"remove(com
$)"
8300 DATA "Remove the given dictionary
from search list"
8310 DATA Status,     0,%00,"status"
8320 DATA "Display current status"
8330 DATA Words,      4,%10,"num(1,com$
,max)"
8340 DATA "Set the maximum length of an
anagram (in words)"
8350 DATA *,          3,%00,"oscli(com$
)"
8360 DATA "Perform OS '*' command"
8370 :
8380 DATA "",         1,  1,""
8390 DATA Yes|No,     2,  2,YN$
8400 DATA <filename>,255,2,ALL$
8410 DATA <string>,  255,1,ALL$
8420 DATA <number>,  4,  2,NUM$
```

GRAPHICS

Listing 1

```
10 REM >Explode
20 REM by Michael Attenborough
30 REM for Arc only
40 REM (c) BAU January 1990
50 :
60 MODE 15
70 PROCinit
80 PROCdemo
90 PRINTTAB(0,0);"Please wait..."
100 PROCpickup(584,456,696,568)
110 PROCcentre("This is some text to d
emonstrate",300)
120 PROCcentre("that the background is
 not destroyed",250)
130 OFF:PRINTTAB(0,0);"Hit a key...  "
140 IF GET
150 PRINTTAB(0,0);dots%;" dots.       "
160 SOUND 2,-15,10,40
170 !nodots=dots%
180 REPEAT:CALL animate:UNTIL FALSE
190 END
200 :
210 DEF PROCcentre(A$,Y%)
220 VDU 5:GCOL 3,63
230 MOVE 640-LEN(A$)*8,Y%:PRINT;A$
240 VDU 4:ENDPROC
250 :
260 DEF PROCdemo
270 LOCAL X%,Y%,G%
280 ORIGIN 584,456
290 FOR X%=0 TO 15
300 FOR Y%=0 TO 3
310 FOR G%=0 TO 3
320 GCOL X%+Y%*16 TINT G%*64
330 RECTANGLE FILL X%*7,(Y%*4+G%)*7,7,
7
340 NEXT:NEXT:NEXT
350 ORIGIN 0,0
360 ENDPROC
370 :
380 DEF PROCinit
390 xpix%=2:ypix%=4
400 VDU 19,0,24,128,128,128
410 S%=10:T%=2^S%
420 VOICES 2
430 *CHANNELVOICE 1 1
440 *CHANNELVOICE 2 9
450 maxdots%=2000
460 room=maxdots%*16+100
470 DIM SP% room,colour maxdots%+100,o
ldcol maxdots%+100
480 DIM pokes maxdots%*4+100
490 DIM Iblock% 16,screen% 8
500 !Iblock%=148:Iblock%!4=-1
510 SYS "OS_ReadVduVariables",Iblock%,
screen%
520 PROCassem
530 DIM dots%(1),pos%(1)
540 CLS:OFF
550 ENDPROC
560 :
570 DEF PROCassem
580 LOCAL N%
590 X=1:Y=2:XV=6:YV=7:addr=4:C1=10:poi
nt=9:GR=3:poke=12
600 base=0:N%=3:X=1:Y=2:XV=6:YV=7:seed
R=4:maskR=5:res=8:poke=10
610 DIM code 18000
620 link=14:sp=13:pc=15
630 FOR PASS=0 TO 2 STEP 2
640 P%=code
650 [ OPT PASS
660 .dotpos  EQUD SP%
670 .nodots  EQUD 0
680 .offscr EQUD 0
690 .pokesadr EQUD pokes
700 .coladr EQUD colour
710 .gravity EQUD T%*0.8 \ gravity=0.8
720 .animate
730 STMFD (sp)!,{link}
740 LDR R5,dotpos
750 MOV C1,#1
760 LDR GR,gravity
770 LDR point,nodots
780 CMP point,#0
790 LDMEQFD (sp)!,{pc}
800 .loop
810 ADD R4,R5,point,LSL #4
820 LDR R6,pokesadr
830 LDR poke,[R6,point,ASL #2]
840 LDRB R7,[poke]
850 LDR R6,coladr
860 LDRB R6,[R6,point]
870 EOR R7,R7,R6
880 STRB R7,[poke]
890 :
900 LDMIA R4,{X,Y,XV,YV}
910 ADDS X,X,XV
920 CMP X,#1280*T%
930 MVNCS XV,XV
940 ADDS Y,Y,YV
950 MVNMI YV,YV
960 SUB YV,YV,GR
970 STMIA addr,{X,Y,XV,YV}
980 :
990 MOV X,X,ASR#S%+1
1000 MOV R6,#255
1010 SUB Y,R6,Y,ASR#S%+2
1020 :
1030 LDR poke,screen%
1040 MOV R6,#640
1050 MLA poke,Y,R6,poke
1060 ADD poke,X,poke
1070 CMP poke,#&2000000:ADRHS poke,offs
cr
1080 LDR R6,screen%
1090 CMP poke,R6:ADRLO poke,offscr
1100 LDRB R7,[poke]
1110 LDR R6,coladr
1120 LDRB R6,[R6,point]
1130 EOR R7,R7,R6
1140 STRB R7,[poke]
1150 :
1160 LDR R6,pokesadr
1170 STR poke,[R6,point,ASL #2]
1180 :
1190 SUBS point,point,#1
1200 BNE loop
1210 LDMFD (sp)!,{pc}
1220 :
1230 .seed EQUD TIME
1240 .mask EQUD &1D872B41
1250 .ret  EQUD 0
1260 .screen2% EQUD !screen%
1270 .dotpos2  EQUD SP%
1280 .pokesadr2 EQUD pokes
1290 .coladr2 EQUD colour
1300 .Xp% EQUD 0:.Yp% EQUD 0:.Np% EQUD
0
1310 .cx% EQUD 0:.cy% EQUD 0
1320 .rw% EQUD 0:.rh% EQUD 0
1330 :
1340 .pickup
1350 STMFD (sp)!,{link}
1360 LDR N%,Np%
1370 LDR X,Xp%:LDR Y,Yp%
1380 MOV X,X,ASR#1
1390 MOV R9,#255
1400 SUB Y,R9,Y,ASR#2
1410 LDR poke,screen2%
1420 MOV R9,#640
1430 MLA poke,Y,R9,poke
1440 ADD poke,X,poke
1450 LDR R9,pokesadr2
1460 STR poke,[R9,N%,LSL#2]
1470 LDRB R11,[poke]
1480 CMP R11,#0
1490 LDMEQFD (sp)!,{pc}
1500 LDR R9,coladr2
1510 STRB R11,[R9,N%]
1520 :
1530 LDR base,dotpos2
1540 ADD base,base,N%,ASL #4
1550 LDR X,Xp%:MOV X,X,ASL #S%
1560 LDR Y,Yp%:MOV Y,Y,ASL #S%
1570 :
1580 FNrand
1590 LDR XV,Xp%:LDR R9,cx%
1600 SUB XV,XV,R9
1610 LDR R9,rw%
1620 MLA XV,R9,XV,res
1630 :
1640 FNrand
1650 LDR YV,Yp%:LDR R9,cy%
1660 SUB YV,YV,R9
1670 LDR R9,rh%
1680 MLA YV,R9,YV,res
1690 :
1700 STMIA base,{X,Y,XV,YV}
1710 :
1720 ADD N%,N%,#1
1730 STR N%,Np%
1740 :
1750 LDMFD (sp)!,{pc}
1760 ]
1770 NEXT PASS
1780 ENDPROC
1790 :
1800 DEF FNrand
1810 [OPT PASS
1820 LDR seedR,seed:LDR maskR,mask:MOV
res,#0
1830 \       use the REPEAT key (shift
F8) to enter this lot!
1840 MOVS seedR,seedR,LSL #1:EORCS seed
R,seedR,maskR:ORRCS res,res,#T%<<1
1850 MOVS seedR,seedR,LSL #1:EORCS seed
R,seedR,maskR:ORRCS res,res,#T%
1860 MOVS seedR,seedR,LSL #1:EORCS seed
R,seedR,maskR:ORRCS res,res,#T%>>1
1870 MOVS seedR,seedR,LSL #1:EORCS seed
R,seedR,maskR:ORRCS res,res,#T%>>2
1880 MOVS seedR,seedR,LSL #1:EORCS seed
R,seedR,maskR:ORRCS res,res,#T%>>3
1890 MOVS seedR,seedR,LSL #1:EORCS seed
R,seedR,maskR:MVNCS res,res
1900 STR seedR,seed:STR maskR,mask
1910 ]
1920 =""
1930 :
1940 DEF PROCpickup(X1%,Y1%,X2%,Y2%)
1950 LOCAL X%,Y%,N%,W%,H%,CX%,CY%,A%,B%
1960 IF X1%>X2% THEN SWAP X1%,X2%
1970 IF Y1%>Y2% THEN SWAP Y1%,Y2%
1980 CX%=.5*(X1%+X2%):CY%=Y1%
1990 !cx%=CX%:!cy%=CY%
2000 W%=X2%-X1%:H%=Y2%-Y1%
2010 A%=T%*16/W%:B%=T%*16/H%
2020 !rw%=A%:!rh%=B%:!Np%=1
2030 :
2040 FOR !Xp%=X1% TO X2% STEP xpix%
2050 FOR !Yp%=Y1% TO Y2% STEP ypix%
2060 CALL pickup
2070 IF !Np%>maxdots% THEN ERROR 1234,"
Too many dots"
2080 ENDIF
2090 NEXT:NEXT
2100 dots%=(!Np%)-1
2110 SOUND 1,-5,150,1
2120 ENDPROC
```

A number of bugs crept into the Poster program(s) in the November issue of BAU. The first is that the programs WILL work on a standard Model B, including those fitted with Econet. Secondly, Listing 1 should not contain line 1130. This should be deleted. Next, change line 770 in listing 5 to read '770 ENDPROC' and change line 970 in listing 1 to read '970 IF c=0 THEN PROCmessage("Check disc has font "+F$,-1):c=OPENIN(defF$+F$)'. Finally, on page 77 it should have read '120 DIM sptable 128, arw 10, os 20' and not '150 DIM sptable 128, arw 10'.

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The creators of Impression come from a background of word processor design that includes some of the most successful word processors ever produced. They are also the originators of the most advanced application programs for the BBC micro and the authors of the best selling word processors for this machine over a period of 8 years.

† Fonts licensed from Acorn Computers

IMPRESSION

The Word Wise

This is a frame based word processor. All text and graphics occur within rectangular frames, which may be positioned anywhere on the page and be any size up to the full page. Frames may be re-sized and re-positioned at any time just by moving the mouse pointer to the frame and dragging. Frames can be thought of as two dimensional rulers controlling not only the left and right but also the top and bottom margins of the text.

Text can be made to flow from one frame to any other on the page, or on other pages - this happens automatically as frames are re-sized or the text is edited or altered. In this way text may be formatted to multiple columns or indeed into multiple sections at any position on the page.

Impression provides total support for frame manipulation. Options include a variety of border types - to liven up the page, or to put a box around some text etc. Frames may be displayed transparent (objects can be seen under the frame) or with any colour background. One other special feature of frames is the text repel option. This forces text to flow around certain frames (containing graphics for example). Unusually Impression allows (if required) text to flow around BOTH sides of a graphic frame, rather than the more conventional approach that normally restricts text to flowing to ONE side of the graphic.

Automatic re-formatting, re-pagination and text flow

Impression keeps the current document totally up to date so that it always exactly mirrors the final printed output. Text is continually, automatically re-formatted as it is edited or altered. There is never a need to issue re-format commands or select re-pagination menu options as is the case with many other word processors. Unlike other DTP systems Impression also allows the text and the cursor to flow from frame to frame and from one page to the next unhindered. For users this means that they can simply type and continue to do so without any regard for frame order or for page breaks etc. Impression copes with it all.

Graphics

Word processors that cannot include graphics on the page are severely restricted and word processors that do support graphics are usually limited to the placing of a simple sprite on the page which cannot be altered.

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- *A specially designed Greek font included*
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- *Full European character set*

Page 1

IMPRESSION

The Archimedes document processor

Spelling checker

Impression is supplied with the Spell-Master interactive spelling checker. This supports a 60,000 word English dictionary, check as you type, dictionary browse, user dictionaries, ignore dictionaries etc. This also has a highly intelligent "guess" word facility. If you misspell a word, or simply mistype it, the computer will bleep. By pressing one key a small window is displayed listing words that it thought you meant to type; clicking on the appropriate word will then replace the incorrect one in the text (and any other occurrences of the word). In practice this usually lists only one or two words and has achieved in tests a success rate of over 90% in guessing the one correct word straightaway.

Abbreviations

Impression allows the user to keep a list of words or phrases and their abbreviations, and will expand any typed abbreviations to the full text. So, for example, you could type 'CC' and get Impression to automatically change this to 'Computer Concepts' - as you type.

Hyphenation

In addition to abbreviation expansion, Impression automatically hyphenates words as you type using some advanced word splitting algorithms. This is particularly important for printing multi-column documents. A hyphenation exception dictionary is provided allowing precise control over the hyphenation points of any specified word.

Character Mode

Impression can be used as a straight forward word processor and in addition to the RISC OS printer drivers (licenced from Acorn) a set of character mode printer drivers are included allowing Impression to drive printers using their built-in character sets. It therefore offers the best of both worlds - high precision, high quality DTP-like prints or fast, traditional, character based word processing.

Automated index generation

Any word or phrase may be selected to appear in the index and by selecting one menu option an index is created at the end of the document listing all references, by page number, to these words or phrases.

Measurements

Impression can display or accept measurements in a large variety of situations. For example, the frame size and position, ruler measurements, text size, line spacing etc, etc. In all cases Impression can display or allow the user to enter these measurements in a variety of unit

...and handle a 500 page document with ease...

Scan-Light



Twiggy in the 60's

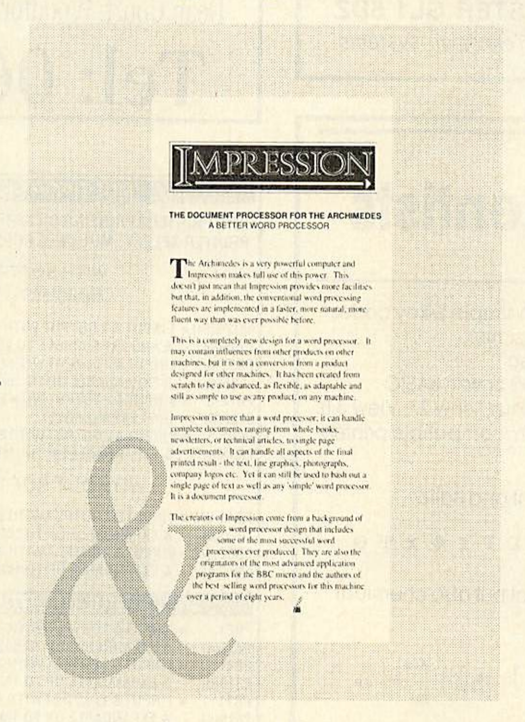
Scan-Light

The Archimedes image scanner.

The above images were 'grabbed' using the Scan-Light 200 dpi scanner. Although this is only a monochrome scanner, a special software anti-aliasing feature can convert any monochrome scan to a 16 grey level image. Such grey-level images are ideal for incorporation into DTP products since they can be scaled to any required size without suffering from any patterning effects that usually afflicts less capable scanning software.

This document is created, edited and printed from Impression, the new document processor.

This entire page was produced on a 1200 dpi typesetter, direct from Impression


IMPRESSION

THE DOCUMENT PROCESSOR FOR THE ARCHIMEDES
A BETTER WORD PROCESSOR

The Archimedes is a very powerful computer and Impression makes full use of this power. This doesn't just mean that Impression provides more facilities but that, in addition, the conventional word processing features are implemented in a faster, more natural, more fluent way than was ever possible before.

This is a completely new design for a word processor. It may contain influences from other products on other machines, but it is not a conversion from a product designed for other machines. It has been created from scratch to be as advanced, as flexible, as adaptable and still as simple to use as any product, on any machine.

Impression is more than a word processor, it can handle complete documents ranging from whole books, newsletters, or technical articles, to single page advertisements. It can handle all aspects of the final printed result - the text, line graphics, photographs, company logos etc. Yet it can still be used to bash out a single page of text as well as any 'simple' word processor. It is a document processor.

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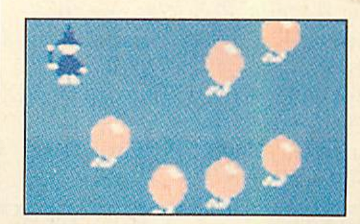
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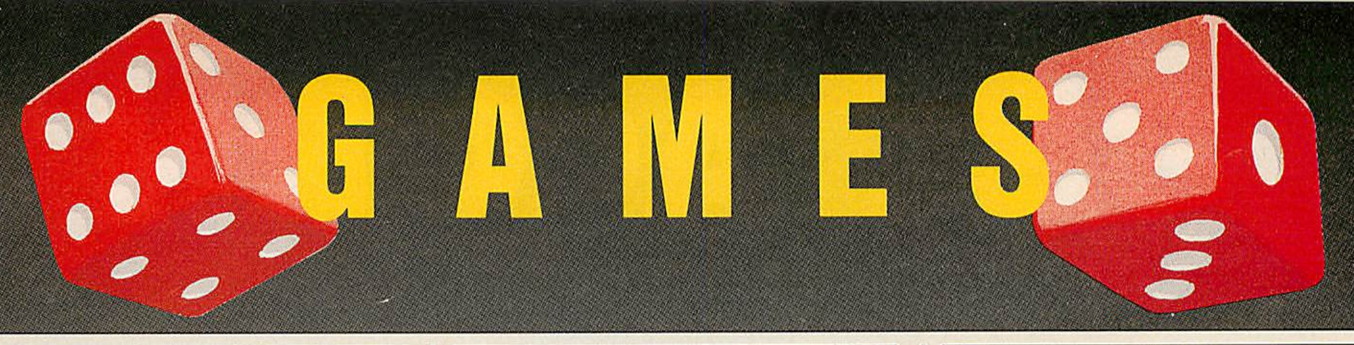
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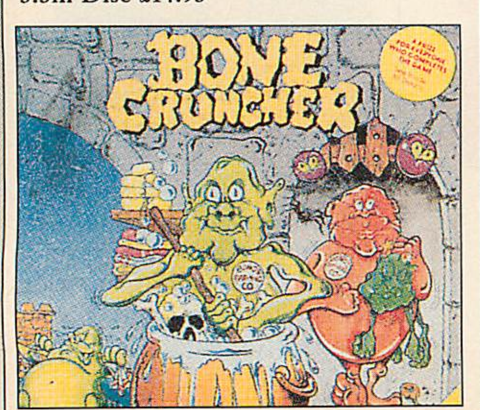
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Sam10 — *Repton Thru Time, 3D Dotty, Zalaga, Qwak*

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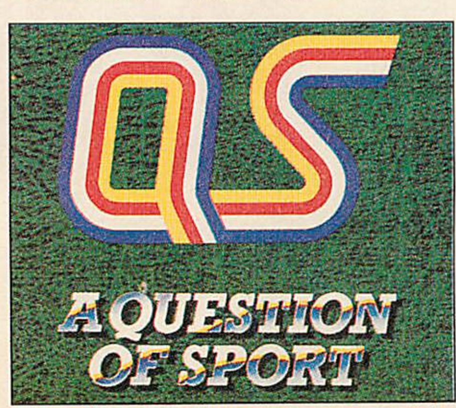
With David Coleman asking the questions and Ian Botham and Bill Beaumont heading up the teams, you can pit your wits against your family and friends, or even challenge your BBC micro.

There are six exciting and fast-moving rounds, including Pictureboard, Mystery Personality and a Quickfire round.

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The questions are asked by a cute character called TP, while the screen layout shows the board along with the progress of each player.

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And for as little as £14.95 we'll send you the complete set of Trivial Pursuit games, including Genus, Baby Boomer and Young Players. If you order today you should receive your set before Christmas and be testing your wits against your family's after Christmas lunch.

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EDUCATION

BBC Acorn User in conjuction with ESM are proud to offer these superb educational programs at up to 27% discount. Tried and tested at home and in schools for many years, Esm's software is the ideal and fun way for children to learn a whole range of subjects using a computer. Of course, we only have room to display a small fraction of their catalogue, so if the program you require isn't here give ESM a call on (0223) 65445. (Please say you saw this number in *BBC Acorn User*)

esm

If you want to make your children's education fun and give them a head start, these programs are what you need. But to be sure of the program you want please order soon, because we intend to feature more of Esm's software in future and, due to space constraints, some of those featured here may have to be taken out.

NUMBER CHASER

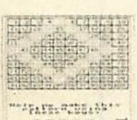
Race games are highly motivating and successful at developing essential estimation skills through multiplication. Young children race a bicycle with numbers 0-10 whilst older children drive a racing car and deal with numbers 0-9999. It is a race against time. A sum appears at the top of the screen with four possible answers. The driver estimates the sum and moves the vehicle to the correct lane. To win the race, players estimate the closest answer to several sums.



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An entertaining game where children mend a faulty calculator by creating addition and subtraction sums. The reward is a working calculator to use in their own work. Faults appear in a 0-100 number square and are mended by building sums using two given numbers. For example using numbers 3 and 5, fault 18 is mended. by 3+3+3+3+3+3 or 5+5+5+3. Fun for all developing strategy and computation skills.

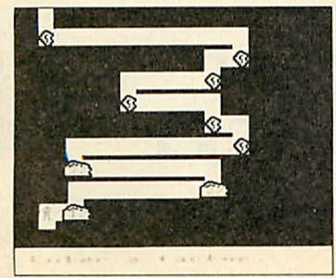


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Four games to help children get to grips with multiplication and factorisation. Games become progressively harder to encourage self-improvement. Prime numbers and common factors of numbers 1-100 are covered.

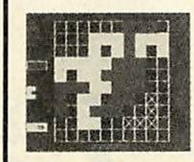
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SQUEEZE

Help children grasp basic geometric concepts. Working together they visualise and discuss how shapes relate to each other and rotate, reflect and slide shapes in a given space to complete puzzles.

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Use *Pazazz* and you'll be surprised just how much valuable work children get from one program.

Children work in groups designing and creating a figure, a scene, composing music and animating the figure for a *Pazazz* performance. You only need one computer, as groups prepare work away from the computer, before they link their work together to make a complete performance.

Four entertaining performances are included, showing how sophisticated *Pazazz* performances can become.



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CRACK-IT

Children truly enjoy the challenge of reading coded messages. many will simply guess at letters whereas the successful code reader will use knowledge of high frequency letters, be aware of letter patterns in words and predict words form the positioning of letters in a word. Two secret messages are included to challenge you at first, then write and save your own. Your children will have fun writing coded messages for each other.

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NOTICEBOARD AND CHATTERBOX

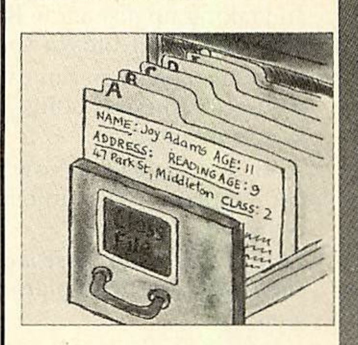


NOTICEBOARD. Create, store retrieve and display short pieces of writing. Similar to a wordprocessor and database. It's simplicity makes it quite unique. A database of British birds is included so investigations like 'What are scavengers?' or 'What birds are speckled?' can be made for reference in classroom work. New databases are easy to make for book reviews, local information or other topic work.

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SUPASTORE PLUS



SUPASTORE PLUS

SupaStore provides all you need for creating, storing and sorting information. The BBC version includes 16K rom, 2 floppy discs (sample database, utility disc); user guide, keycard. The Compact and Archimedes version includes utilities and sample databases on one 3½in disc, user guide and keycard.

SupaStore Plus gives you all the features of *SupaStore* and more. It contains *SupaStore* and an extra disc. You can modernise your old database system by using files from *Quest, Grass* or *Viewstore* and edit, or add to these files. It includes efficient editing facilities — when you delete records the library is compacted and records are renumbered, so blank records do not appear. It's ideal for personalised letters and detailed reports. You create your own layout for reports, so they appear printed in the format appropriate for your needs. Simply merge *SupaStore* files with any main wordprocessors eg, *Wordwise, View, Edword.* You can also include numerical fields and make simple calculations. It speeds up editing. You can delete, change or append information automatically on a collection of records; delete a group of records and compact the remaining ones; combine two separate databases. You can upgrade your databases from DFS to ADFS if you upgrade your hardware.

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NOW YOUR BBC MICRO CAN TALK BACK FOR AS LITTLE AS £4.95!

Speech! is an incredible piece of coding, needing no extra hardware and taking up just a few K of memory, it converts your BBC's sound chip into a full-blown speech synthesiser!

Once installed you can call it from your own programs with simple-to-use commands. Plus you can fully configure it to speak in any accent or pitch.

And you can teach it how to pronounce unusual words and phrases — adding them to the built-in dictionary — customising *Speech!* to your own requirements.

Due to a bulk purchase we can offer this unique program to you for less than half price. But place your order soon as they're sure to be in high demand.

	Tape	*5.25in*	*3.5in*
RRP	£9.95	£11.95	£14.95
BAU Discount	£5	£6	£7.50
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Please note: *Speech!* is not compatible with the Electron



THE TOTAL DTP SOLUTION

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The Publisher is a remarkably easy to use and powerful Desk Top Publishing package, featuring its own page description language, allowing you to operate it from within *Wordwise, Wordwise Plus, View, Inter-Word* or *Wordpower,* and giving you total control over the layout of your documents.

It features a unique preview mode so that what you see is exactly what you get, including different sizes of font, reversed text, grey backgrounds, centering, left and right justification, 8 box styles for highlighting text and creating borders, and much, much more.

Combined with the 86 fonts, *The Publisher* offers you everything you need to produce professional-looking results — all in one package, and for less than £50!

But remember, this is a limited offer, so to be sure of your *Publisher* kit order your copy soon.

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THE PUBLISHER



FONT LIBRARY



With the unique *Multi-Font Near Text Quality* two-Rom pack from PMS you can create professional-looking documents on a standard Epson compatible printer for under £20!

The popular PMS *Mult-Font NTQ* has been available for the BBC for nearly two years. But now Electron owners can take advantage of its superb page production facilities as it has been totally rewritten to make the most of the Electron's hardware.

It has all the features of the BBC version, including multi-height, width, font and pitch – all on the same line, inverse, backgrounds, underline, micro-justification and much, much more.

And what's more, because it's on Rom you can use it from within *View*, *Wordpower* or *Wordwise* (with the E2P or Mode 7 adaptor), or simply from Basic.

The whole package comes on two 16K roms which can be fitted to a cartridge or into the Slogger Rom Box or Rom Box +, plus you get a powerful font designer so you can create your own fonts.

But please remember, the *NTQ* system will only be available at the special price of £19.95 for a limited period, so place your order soon.

PMS MULTI-FONT NTQ
NEAR TEXT QUALITY
PRINTER DRIVER

THE SOFTWARE YOUR DOT-MATRIX PRINTER HAS BEEN WAITING FOR.

NOW --- BBC B, B+, MASTER and ELECTRON users with EPSON RX/FX compatible printers can obtain printed output of a quality hitherto unknown.

This amazingly powerful and unique piece of ROM BASED software, allows anyone to produce printed material, guaranteed to impress. The authors have created an easy to use system, with the following UNIQUE features - all of which can be freely mixed in ONE LINE OF TEXT!

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MULTI-FONT MULTI-PITCH
INVERSE
UNDERLINING

As you can see this is not simply another NLQ utility!

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9 OUTLINE TE
10 TALL STYLE
11 BOLD TYPE
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13 ROUNDHA
14 BROADW
15 HOLLOW

This leaflet was prepared using WORDWISE PLUS, and printed on an EPSON.

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ACORN BBC ACORN USER

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You know that *BBC Acorn User's* yellow pages consistently bring you the best in new software for your BBC or Archimedes each month.

But why not save the wear and tear on your fingers, and get programs that work the first time by ordering this month's disc.

As usual it's packed with plenty of software for everyone, ranging from handy utilities to challenging games.

Alternatively, see the subscriptions page in this mail order section for an extra special offer that can save you up to £50.

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Let people know that you have one of the best microcomputers with the new Acorn range of products which are only available through *BBC Acorn User* magazine.

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Finally let us introduce you to *Archie,* everybody's soft cuddly friend. Archie wears either an Acorn T-shirt or one with the well-known Archimedes logo, he's great fun as well as being of superb quality. Why not give Archie a home either as a gift or a club mascot?

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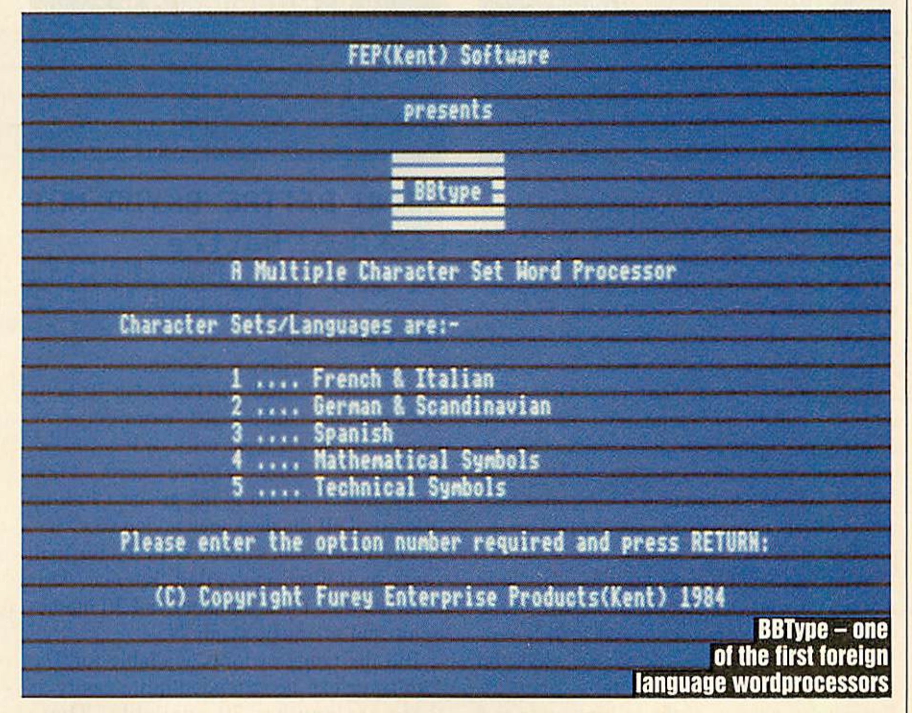
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WHEN IN ROME

DAVE FUTCHER goes in search of the best word processor to help him stay in touch with his foreign friends



BBType – one of the first foreign language wordprocessors

The BBC model B and its successor, the BBC Master 128, have always been widely used in many scientific and technical applications, in schools, colleges, the business world and at home. Unfortunately, it has never been an easy task for foreign language, scientific, mathematical or technical signs, symbols or characters to be easily produced in wordprocessed documents.

With best selling BBC wordprocessors like *Wordwise Plus*, *View* or *Interword*, if you wanted to do much more than produce the simple formula for the area of a circle or the chemical formula for water you would find it very hard work, if not impossible!

Luckily a number of software developers did set out to help the many thousands stuck with the lack of special characters and symbols – either producing standalone specialist packages for specific use with complete sets of special characters or symbols or by providing add-on packages for the popular wordprocessors.

BBType

Probably the first foreign-language character wordprocessor available for the BBC was introduced in 1984 by Furey Enterprises. It was called *BBType* and is still available today. The package includes comprehensive character sets for French, German, Italian, Spanish and Scandinavian languages. It also has sets of what Furey describes as technical and mathematic characters which includes a good range of mathematics and statistical symbols.

Access to the characters is by means of four levels of function keys, with the once very popular *BBKey* function key strip being the heart of the easy access.

Despite its age, *BBType* has remained popular with some users for small tasks like writing business letters or producing examination papers.

BBType is a Wysiwyg text editor with reasonable editing facilities based around a 20-line scrolled window. Its major limitation is that it only allows the production of a single sheet of text (866 lines by 80 characters) at a time.

A file conversion utility is also available that will input a formatted *Wordwise Plus* or *View* document and then create one *BBType* file per page. These new files can be processed and printed using *BBType* as normal. Some extra language options are also available to cover Welsh/Gaelic, Attic Greek, Esperanto and Phonetics. These cost £5 per set.

Euroword

Wordwise Plus is certainly the most popular of all the BBC wordprocessors but getting cedillas, acute, grave or circumflex accents into your text is rather difficult. Some people have solved the problem by redefining certain characters and using embedded commands. The real answer for the dedicated *WW+* users is *Euroword* which is a disc-based add-on that provides five full sets of accented characters: French/Italian, German, Spanish, Nordic 1 and Nordic 2.

It relies on a number of levels of function control keys to give access to special characters, but it is also possible to overprint certain accents.

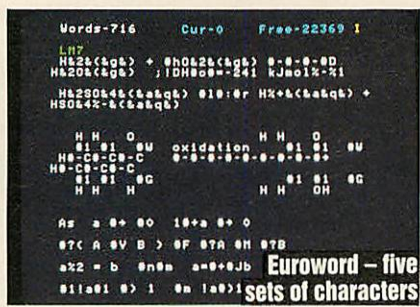
Euroword supports Epson-type printers, certain daisy wheel printers and the IBM extended character set which means it can be used with non-standard printers like the Brother EP/44. Unfortunately, the main *Euroword* program occupies normal Ram and so reduces the memory available for text by some 20 per cent.

Sciways

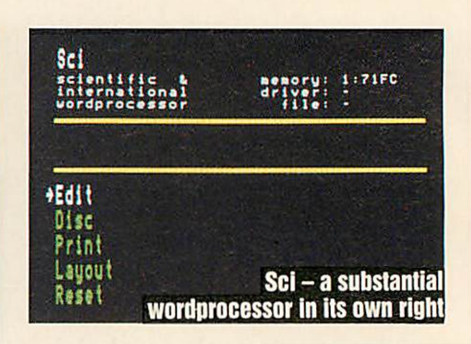
If you are a *Wordwise*, *Wordwise Plus* or *View* user and have the need for special characters for scientific, mathematical and statistical work, one of the most comprehensive packages around must be *Sciways*, a 16K Rom that instantly provides over 350 newly defined characters, plus the facility to define 26 of your own. Every character you could wish for is included: general mathematical characters, boolean and set characters, derivatives, chemical characters, superscripts, subscripts, bracket-type characters and two complete Greek alphabets. In addition, a set of files covering the characters needed for European language work is provided for loading into memory and control by *Sciways*.



Euroword – for Wordwise Plus users



Euroword – five sets of characters



Sci – a substantial wordprocessor in its own right

Sciways is very easy to combine with *View* and *Wordwise Plus*. All the characters that *Sciways* offers are very easy to obtain. It's all done by a combination of two characters. The first of these is called the 'prefix'. Mayhew Telonics has chosen characters that are most unlikely to appear as the first characters of a word. They are ! Greek letters, # scientific characters, $ user-defined characters, % superscript characters and & subscript characters.

The second character decides on which actual character out of the set defined by the prefix is printed.

What makes *Sciways* so good to use is that the special characters are shown on the screen when text is previewed in *WW+* or *View*. It's great being able to see what you are going to get, before you print it. Especially as some of the tall integrate and matrix brackets have to be built up in sections over a number of lines.

Over 80 scientific characters are supported by the *Sciways* Rom. There are plenty of chemical characters including the cell diagram symbol and parts of the benzene ring. The general mathematical characters cover vectors, approximates, angles, roots and simple fractions.

There is a very full collection of boolean and set characters too and all the bracket-type characters you need.

The package also supports the full Greek alphabet in upper and lower case, and in both upright and italic styles. This is particularly helpful for anyone involved in mathematical and statistical work. So if you need the sign for sigma, the population mean, the population standard deviation or the population product moment correlation coefficient, one of the Greek alphabets will cover it. All these Greek letters can be used along with other scientific characters.

Another potentially useful feature of *Sciways* is the facility it has for constructing brackets and bracket-type symbols such as the integration sign. There are 17 characters available for the construction of such compound symbols.

Sciways is a first-class product. It has been very well thought out by its author. Anyone involved in scientific or technical writing wanting to stick with *View* or *Wordwise Plus* on their BBC micro cannot afford to be without it!

"ÄNNU BÄTTRE SKYDD MOT
LÄCKAGE! bättre
Nu med

Euroword caters well for Scandinavian languages

The Publisher

Another possibility for specialised wordprocessing is to add *The Publisher* Rom by PMS to your standard BBC wordprocessor. It can be interfaced with *WW+*, *View*, *Interword*, *Mini Office* and *View Professional*, which is the greatest link-up offered of all the packages reviewed.

The Publisher comes with 16 built-in fonts including one called Science. This contains the Greek alphabet and 30 mathematic and scientific symbols.

But the range of fonts available for *The Publisher* can be extended quite easily as there are another 70 available. These include some excellent ones specially designed for producing high quality printout in French; with Booktype, Italic, Isonorm, Sans Serif and the Standard styles available in a number of point sizes. Most languages using the Roman script can also be coped with when using *The Publisher* by using the All Foreign font, which seems to includes all the foreign-accented letters.

Probably *The Publisher'* s greatest asset is its ability to produce really high quality print-out with proportional spacing, full justification in variable height, width and pitch with shaded backgrounds.

Wordpower

Wordpower from Ian Copestake Software is one of the lesser known BBC wordprocessors despite its extensive sales to schools. It is however a unique and powerful package and the latest version 4 when coupled with *Power Fonts*, is an ideal package for anyone who needs to use special characters whether for European languages, or any other subject.

With *Wordpower* you are able to show on screen a mixture of, say, English and Russian text, or a multi-line mathematics expression, just as they will be printed. In fact up to 220 different characters at a time can be typed very simply and printed on a wide range of printers. If you want to wordprocess in languages from Albanian to Vietnamese as well as French, German, Spanish or Russian, there is nothing that will beat *Wordpower*. Its mathematical, statistical, physics, chemistry and electronics character sets are also first-class. But probably where *Wordpower* really stands out from other linguistic and scientific wordprocessors is the superb print quality available on a range printers.

Name	Add-on package	Format	Foreign fonts
BBType		disc	5
Euroword	•	disc	6
The Publisher	•	Rom	86
Wordpower		Rom	40
Sciways	•	Rom	2
Sci		Rom	1
Wasp		disc	1
European Folio		disc	1

Sci

A totally different approach to specialised character and symbol wordprocessing is offered by Peter Volk's Rom-based package called *Sci* which is a complete scientific and international wordprocessor for the BBC micro.

Sci is not an add-on to *Wordwise* or *View*, but is a substantial wordprocessor in its own right. It provides scientific symbols, superscripts and subscripts for laying out equations, and special letters and accents for typing in most European languages.

The *Sci* wordprocessor provides a total of 250 different characters. These are split into three character sets, which are accessed by three of the BBC's red function keys. There is an AB set which contains all the characters normally produced from the BBC computer's keyboard. Then there is the Alpha Beta set of 63 additional characters. This includes all the lower-case Greek letters and all the upper-case Greek letters.

"Est ce que tu sais leur nommes, bérgère? Mais oui, maitresse. Ici, nous vivons plus près des étoiles et nous savons ce

The Euroword French/Italian font

POWER FONT CHEMISTRY 4

9-PIN PRINTER

ALL SEEN ON THE SCREEN

ΔΛΠΘΣΩαβδεγηκλμνϖπθρσστωϖχ

Wordpower

Maths/ science	Font designer	Wordprocessor link
•		
		Wordwise Plus
•	•	Interword Mini Offie View View Professional Wordwise Plus
•		
•	•	View Wordwise Plus
•		
	•	
	•	

As $a \to \infty$ $1 \div a \to 0$

$\sim(A \vee B) \equiv \sim A \wedge \sim B$

$a^2 = b \Leftrightarrow a = \pm\sqrt{b}$

$|\alpha| > 1 \Rightarrow \alpha > 1$ or $\alpha < -1$

$1 \div x < 1$

Sciways – every character you could wish for

The final set of characters is the technical one that contains 70 scientific and technical symbols and 10 accents.

Individual special characters are accessed by pressing the appropriate function key followed by its letter key. For instance, Greek gamma would be obtained by pressing f1 followed by g. If you want to type several letters in the Greek set you are able to switch to it permanently by pressing CTRL-f1. Return to the normal AB character set by pressing CTRL-f0.

The way you obtain the accented characters is probably the most interesting. They have to be entered in a certain way and then appear over the preceding character.

Finding which key gives which character is not that difficult as there is a Help facility available by SHIFT-f0.

Sci is an outstanding package. It is a full-blown wordprocessor in its own right, with bold, italic and underlining on screen. At £29.95 it is amazingly cheap, offering probably the most effective way to get special characters and symbols into your text.

WASP

WASP which stands for Word and Symbol Processor was developed at Cambridge University of Engineering and is published by the National Extension College in Cambridge.

It is a package that can be learnt instantaneously as it only has 10 editing commands. Despite its simplicity, it's able to give a reasonably presentable output with the minimum of effort. The user always sees exactly on the screen what will be produced on paper. *WASP* is entirely disc-based, so can be transported by a user who has access to more than one computer. The first copy of the program costs £19.95 and subsequent copies cost £5. *WASP* can also be used on Econet.

The program will operate with just a standard BBC model B, yet can handle any file provided it will fit on a disc. Amazingly, *WASP* is mostly written in BBC Basic and therefore can be modified by the ambitious user, who perhaps wants to take full advantage of some special feature available on their printer. For instance, *WASP* does not cope with proportional spacing and superscripting.

WASP, is only provided with one set of special characters, which certainly enabled me to use it for European wordprocessing. When it came to using it for mathematical work, I had to turn to the quite useful Font Design program provided in the package.

Folio

Finally no review of specialised BBC wordprocessors can be complete without mention of *Folio*. Tedimen Software has long sold one of the best educational wordprocessors. It followed this up about two years ago with the release of a set of European wordprocessors – *French Folio*, *German Folio* and *Spanish Folio*.

These new packages extend the ordinary *Folio* package that found its way into over 16,000 schools in England, but retained the elegant simplicity. With the European products the menu screens are translated into the appropriate language, and accents are provided as individual entities which can be used in conjunction with any letter.

Those teachers of Russian or Italian should not despair as there is a European Development Pack called *ELDeP Folio* for designing all the characters required.

Conclusions

Any one of these word and symbol add-on packages or specialised processors will put an end to having to add hand written scientific symbols or foreign accents to word-processed text or the painstaking construction of user-defined characters.

If you are looking for a truly powerful foreign language and maths/science word-processing package, *Wordpower* and its *Power Fonts* will provide you with real quality on screen and printed text. If you are looking at true value for money, *Sci*, the scientific and international wordprocessor, is an outstanding buy.

If, however, you want to stick with *Wordwise Plus* or *View* you will find *Sciways* hard to beat.

One thing is certain. With *Wordpower*, *Sci* and *Sciways* you have access to very good and comprehensive language, mathematics and scientific wordprocessors that are reliable and easy to use. They are also very cheap.

BBType, *£23. Furey Enterprise Products, 7 Manor Park, Froxfield, Wilts SN8 3LF.*
Euroword, *£14.95. Charm Micro Soft, 10 Hall lane, Longton, Preston, PR4 5XB.*
The Publisher, *£46. Permanent Memory Systems, 38 Mount Cameron Drive, East Kilbride, Scotland G74 2ES.*
Wordpower *and* Power Fonts, *£40.25. Ian Copestake Software, 10 Frost Drive, Wirral, Merseyside, L61 4XL.*
Sciways, *Mayhew Telonics £38.52, 376A Ringwood Road, Poole, Dorset, BH12 3LT.*
Sci, *£29.95. Chesterfield Software, 61 Chesterfield Park, Little Chalfont, Buckinghamshire, HP6 6RU.*
WASP, *£19.95. The National Extension College, 18 Brooklands Avenue, Cambridge, CB2 2HN.*
European Folio, *Tedimen Software, PO Box 23, Southampton, SO9 7BD. It costs £24.95 for one language with reduction for groups of different languages.*

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The **shell** is a ready-to-run RISC OS application in line with Acorn's guidelines. The shell uses a large body of **run-time** code. The run-time automatically handles windows, menus, icons, etc. so detailed knowledge of the WIMP manager is not needed. You extend and fine-tune the shell by adding menus and windows using the tools, and writing functions and procedures to carry out the tasks of your application.

An in-depth user guide takes you gently step-by-step through a progressive series of some 50 program building sessions from complete beginner to advanced level. All examples are on disc ready to run.

The complete system (V1.2) comes on 4*800k discs with a 500-page ring bound user guide. You need an Archimedes or A3000 with 1M or more of RAM and fitted with RISC OS. One disc drive is sufficient. There is no extra licence fee to distribute copies of the run-time in your programmes.

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- ★ Create a new, ready-to run shell application from the tools menu by a simple RISC OS file save operation. Now double-click SELECT on your new application. It loads and appears on the iconbar. Click MENU on its iconbar sprite. A menu with the standard 'Info' and 'Quit' items pops up. Click SELECT on the sprite and a main window appears complete with its own menu. This is your starting point.
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- ★ Handle standard window types almost automatically with the run-time. eg warning messages, scrolling lists, displaying '!Edit', '!Paint' and '!Draw' files, file saving, window printing, radio button sets, etc.
- ★ Set-up the contents of more complex windows visually with WYSIWYG editors.
- ★ Place icons in windows to provide powerful but easy-to-program facilities. Pop-up menus from icons. Call BASIC functions direct from icons. Accept user input into BASIC variables with writeable icons. Display the contents of BASIC variables in icons.
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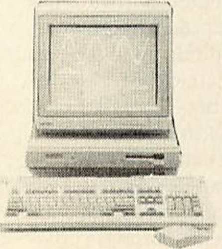
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EUROWORD

for WORDWISE and WORDWISE PLUS

Converts Wordwise to a European wordprocessor. Provides French, Italian, German, Scandinavian and Spanish characters grouped into five sets. For example:

French/Ital	German	Spanish
à ç é è ù ò ì	Ä Ö Ü ä ö ü ß	Pt ¡ Ñ ¿ ñ ç

Additional accented characters are easily produced by overprinting a UK character wth an accent as in ê. Euroword supports a range of printers including Epson type dot-matrix, Diablo 630 printwheels and the IBM extended character set.

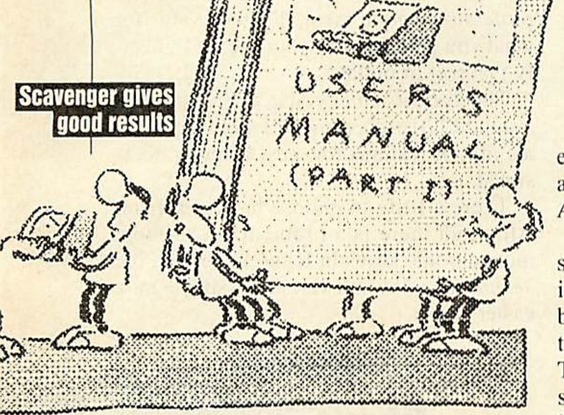
"Wordwise-using modern language teachers should fall on Euroword gratefully" – Times Educational Supplement, 3 Feb 89.

Charm Micro Soft
10 Hall Lane,
Longton, Preston.
PR4 5XB. 0772-616705

Euroword is supplied on disc. A backup disc and 40 page manual are included. Price £14.90 inclusive. Please specify your printer and 40 or 80 track disc.

You don't need to be a Picasso to produce perfect pictures on your Archimedes. Cheat and scan existing photographs or drawings. **GRAHAM BELL** explains how and looks at three of the latest scanners

SPITTING IMAGES



Scavenger gives good results

Drawing diagrams or creating original pictures on your computer can be a lengthy process or impossible, if like me, you can barely draw the curtains. Scanning an existing photograph or line drawing is an alternative that's becoming more affordable with the launch of several more scanners for the Beeb and Archimedes market.

Computer Concepts' Scan-Light scanner was reviewed in the July 1989 issue of *BAU*. Since then, there's been a flood of Arc scanning packages, most based on the cheaper 4in wide Taiwanese hand-held scanners. This review looks at offerings from Technomatic, Irlam Enterprises and Beebug, plus a similar Watford scanner aimed at the Master and original Beeb.

TECHNOSCAN AND SCAVENGER

Beebug and Technomatic both produce Archimedes scanners based on the Taiwanese Geniscan 400dpi hand-held scanner, though they use slightly different models. Each comes with an interface podule to plug into your Arc's backplane (A3000 owners will need to fit a backplane). A3000 owners will also need to install a podule box to protect the interface card but fitting the podule precludes the fitting of any other normal podule or the Pres expansion box and podulettes. There aren't any internal scanner interfaces for the A3000 yet.

The *Technoscan* package consists of the scanner, interface, disc and manual. The interface card is neatly designed and well built. There's a single flying lead to connect to the backplane's 12V supply and Technomatic can supply a separate power supply if you have an A3000 or a fully-loaded Arc. The scanner plugs into the rear of the podule via a mini-Din plug.

The software is on disc and the application can be started in the usual Risc OS way. Clicking on the scanner icon opens up a single blank window and the main menu contains the obvious 'Scan' option.

Selecting this turns the mouse pointer to a tiny 'scanner' and it's obvious that you press the Start button on the scanner and draw it across the picture.

One nice touch becomes immediately apparent – the screen border turns blue and flashes red if you move the scanner too fast. As you scan the photo, the image appears in the window on screen. Reaching the bottom of the viewer window or pressing the space bar ends the scan.

After you've scanned a picture, there are a number of editing options provided on the menu. You can inspect the image at any magnification, flip it or cut out a section. You can save each image as a standard mode 12 sprite or transfer it to another application like *Paint* or *DTP* (if you have enough memory to run both together).

The Geniscan has switches for resolution (100-400dpi mono – a final grey-scale image of 33-133dpi), a contrast adjustment for particularly pale or dark pictures and a switch which changes between 'Letter' and three variations of 'Photo' mode.

The letter mode is supposed to give a true mono scan but it doesn't – you still get 16 greys in the final sprite. The three photo modes require experimentation for each scan. The difference between them isn't made clear by the manual (which in other respects is a model of clarity).

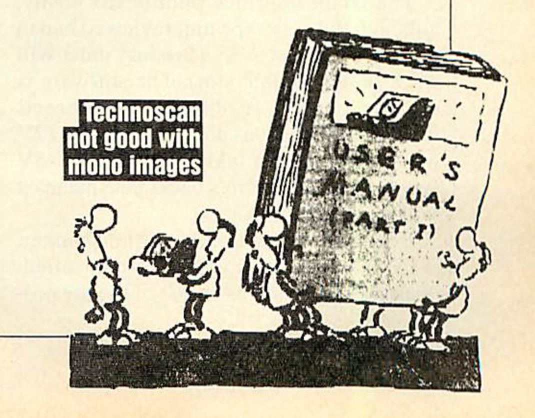
Test scans with the *Technoscan* produced



Technoscan – on screen images



The Beebug podule and Technoscan



Technoscan not good with mono images

very good results. If you can move the scanner consistently and slowly then the quality of the final sprite is excellent and the software makes it very easy to use. The Technomatic scanner consistently produced a spurious dark bar down the left of anything scanned in 'Photo' mode (not in letter mode). This was probably due to a fault in the review model.

The Beebug unit is similar. The podule is virtually identical, though it has tracks for extra circuitry for a forthcoming A4-width scanner. The software is contained entirely within the podule Rom so there's no disc with the package. But you setup the scanner with a simple star command and then store all your preferences of resolution, page size and so on, in a small 'start-up' application called *Scavenger* on disc. Running this initialises the scanner.

The software installs itself on the icon bar. Starting it up produces a single window and a small menu. The menu allows you to scan items, edit the resulting images and save the sprites in a sprite file or a compressed format that can only be re-used by *Scavenger* itself. Sprite editing is fairly basic – cropping, resizing, and reflecting – and it's better to leave this to a real sprite editor like *Paint*.

While scanning, a small green LED blinks off if you've gone too fast, which causes lines of pixels to be missed out of the final image. The results are acceptable, and essentially identical to the *Technoscan* unit. The difference lies in the software, with the *Scavenger* unit allowing a collection of several scanned images in a single file. The *Technoscan* allows only a single sprite in each file. *Scavenger* shows the sprites in a file as postage-stamp sized images on screen, much in the manner of *Paint*.

IRLAM I-SCAN

Irlam Enterprises is new to the Archimedes scene but has been making electronic instruments for some years. Its *I-Scan* scanner is the only one of this bunch that has a motorised paper feed, the only one to scan full A4 width or to give a true 200dpi grey scale, and it has by far the highest price tag – £780. Picking up the scanner gives you one good reason for the price: it's very solidly built (by Irlam itself), with a thick metal case.

The Irlam interface podule fits easily, although the prototype unit reviewed had to go in podule slot zero. (Product units will work in any podule slot). The software is supplied on disc. A ribbon cable connects to the scanner unit, as does the separate 12V power supply. Not taking the 12V or -5V supply from the micro's backplane means it will work with an A3000.

There are no switches on the scanner. This unit is entirely software-controlled. Starting it up in the usual Risc OS way produces two windows on screen – one a control panel and one a viewing window which represents the A4 scanning area. With the control panel, you can set up the part of the A4 page to be scanned, control the contrast and switch between 100 or 200dpi resolution. Then you put a sheet on the scanner, tuck the front edge under the rubber roller and click on the Scan menu option.

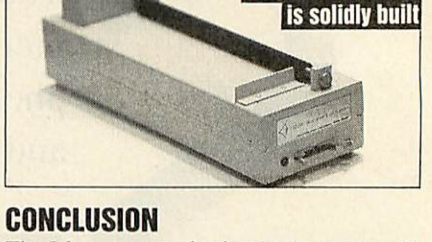
The advantage of the motor feed is that you don't have to worry about moving the scanner evenly over the picture. It pulls the paper through at an even, correct speed and keeps the whole thing straighter than you can by hand.

This could be of great value in education, where the tank-like construction will also be an advantage. The downside is that you can't scan from books or bound material – only flat sheets will pass under the roller. Nevertheless the scanned image is of superb quality. The *I-scan* can produce 16 grey scales at its maximum 200dpi resolution and the contrast adjustment gives good control so you can scan anything from the darkest photographs to the lightest pencil sketches. Setting up a palette with all 16 possible greys improves the screen image immensely.

The 100dpi option is useful for a quick preview of the scan. You can then adjust the scanning area (a red box is shown together with the scanned picture on the viewer window) so you get only the area you need when you scan at full resolution.

This is vital for 1Mb machines, as a typical postcard-sized photo could be a third of a megabyte – there's no room for more of the picture than you need. It's a shame there's no control over the number of shades in the scan – you can't do a simple mono scan of a black-and-white logo for example, which would need only a quarter of the memory.

The software allows you to view the scan at any magnification, and save all or part of the image as a mode 20 sprite either to disc or to another application (*Paint* or *DTP* for example).



The Irlam scanner is solidly built

CONCLUSION

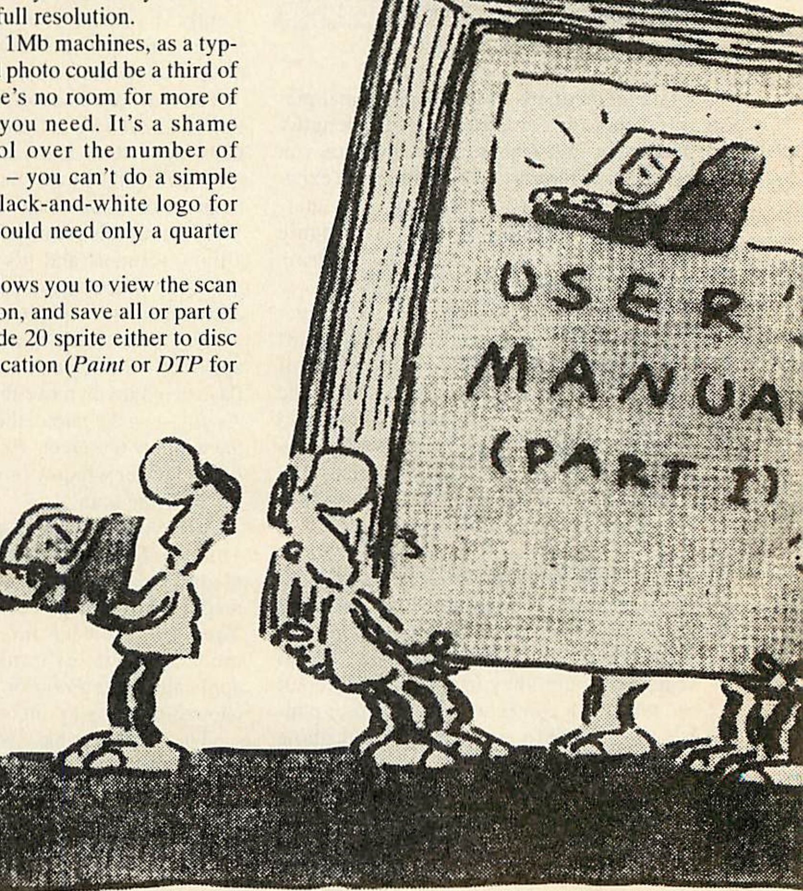
The Irlam scanner is simply the best available. Its quality matches that of Macintosh scanners costing well over £1000. The sprite images generated beat the other Arc scanners hands down.

Irlam has future plans to release upgrade software to boost the resolution to a staggering 800dpi in mono.

The one drawback of the Irlam *I-Scan* is its cost. It retails for a sobering £780. As professional equipment, it's good value for what you get, but does your use for it justify that sort of outlay?

The *Technoscan* or *Scavenger* units, at around £170 each, provide a more appropriate mix of features for most home or occasional users.

There's little to choose between them. Although there is a problem with simple monochrome scans in letter mode with the *Technoscan*, the software is possibly a mite easier to use.



Irlam scanner – expensive but impressive

HOW SCANNING WORKS

All the scanners work in the same way. A row of LEDS illuminate the picture, and the brightness of the reflected light is measured by a long, thin CCD (charge-coupled device) sensor.

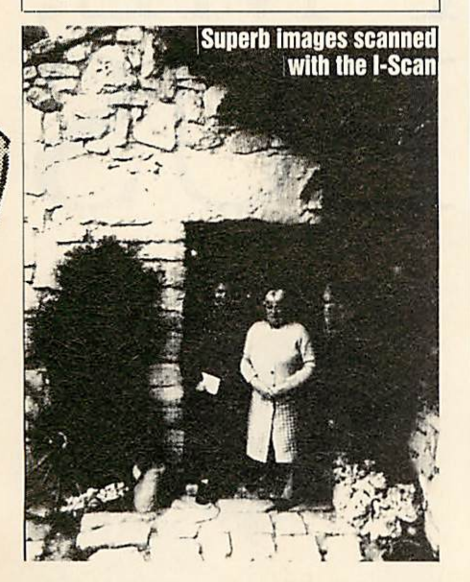
The data for brightness for one horizontal row of the picture is sent to the micro.You need to move the scanner down fairly slowly and evenly: a roller on the bottom of the scanner notes when you've moved it down one row and the next set of pixels is scanned.

Fundamentally, the quality of the scan depends on the resolution of the CCD strip: some of the scanning strips have 200 pixels per inch, some 400.

But the 400dpi strips can only pick up black and white. They generate pseudo-grey scales by reducing their effective resolution to 133dpi.

All the scanners work well from original photographs but scanning from printed pictorial material can be a problem. The reason is that all printed pictures, are made up of dots. The dots in the photo can clash with the 'pixels' that the scanner sees, creating moire patterns like grey stripes across the scan.

You can usually get rid of this by scanning at a different resolution.


Superb images scanned with the I-Scan

I-Scan is simply the best available

EDUCATION

This article will parents and teac directly affects ents will want t

WATFORD's BEEBSCAN

Watford Electronics' new *Beebscan* is the latest add-on for an original BBC model B or Master. The hardware is the same as the Watford or Beebug Archimedes scanners, with the addition of a sideways Rom and a small interface box that plugs into the micro's 1MHz bus and power supply.

The instruction sheet is meagre but adequate, with the *SCAN command being the key. It's as simple as plugging everything together, switching on the scanner and typing *SCAN. Press the start button on the scanner and as you roll the scanner across a picture the image appears on a mode 0 screen. A Basic program given in the manual lets you save the screen image to disc.

The scanner is the familiar Geniscan hand-held unit that's capable of scanning text or photographs up to 4in wide. With a button on the side, you can choose to scan at 100, 200, 300 or 400 dots per inch but with the Beeb, only the coarsest two resolutions are usable.

Both give a monochrome image on screen, with dithered pixels simulating up to 16 grey levels. You can choose one of three sets of dithering patterns with a switch, or turn dithering off altogether for scanning black-and-white only. There's also a thumbwheel to control the overall darkness or lightness of the image. It's important to get this setting right, as it can make a big difference to the final image.

Mono scans look very good, a 3in strip of text or line drawing being displayed in full mode 0 resolution. However, with toned material, the quality of the dithered screen image is fairly poor. That's entirely down to the limitations of the Beeb. With the 'best' dithering, only about 220 'pixels' can be displayed across the screen – (nine mode 0 pixels are used to make up each dithered pattern) – so the image lacks fine detail. In 200dpi mode, only four fifths of the width of the scanner is used. But it does work and if you find the quality acceptable then even poor photos can be scanned in.

They can even be 'retouched' using your favourite painting software.The software does make everything quite foolproof and it goes to some lengths to ensure what's scanned looks the same shape on screen.

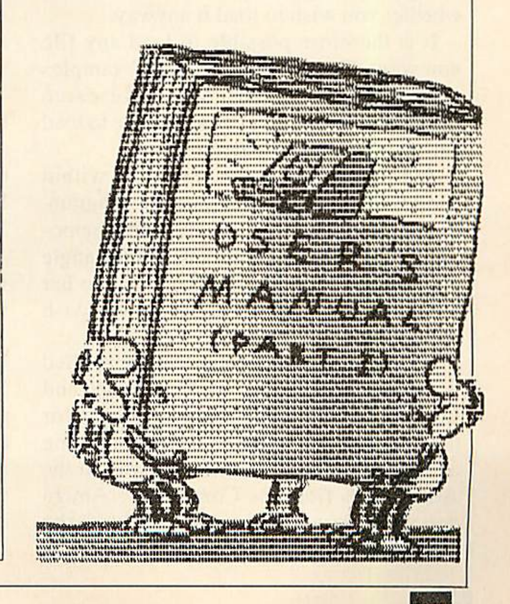
But there's a double height mode that allows more detail in the vertical direction, should you want that. As a bonus, the Rom can replace Watford's own *Wapping Editor* Support Rom, and with it you can scan pictures directly onto your *Wapping* page under mouse control. This combination is ideal for simple DTP on the Beeb and the scanner and interface are quite cheap at £155.

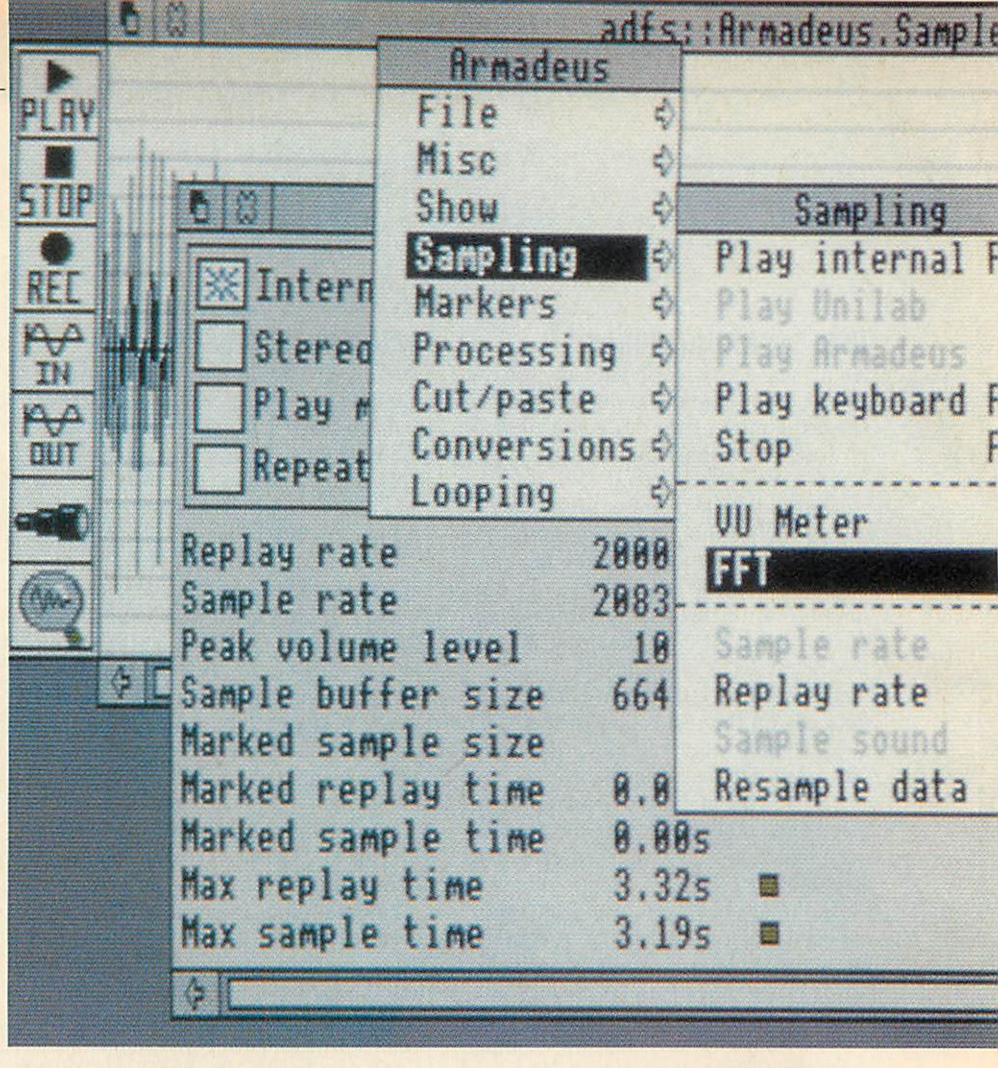

Beeb or Master owners can use Watford's Beebscan


Good quality images are produced, especially in mono

Perhaps the lea processing soft micro users is spreadsheet. Tl sion to anythi volving numbers has g sheet an unpopularity i deserve, and yet it can many kinds of ways.

Without being techn





Clares' sampler package, *Armadeus*, comes in two parts, hardware and software. The hardware is in the form of an 8-bit sampler with two inputs (line and microphone) and its own output line. This can be used as an alternative to the headphone socket on the back of the Archimedes and as a result, gives clearer sound. Whereas the Archimedes filters its own sound output, no such filtering is carried out on the *Armadeus* board, thus allowing a larger frequency range to be played back.

THE SOFTWARE

What really makes the package is the software. On loading it up, you are presented with a rescalable window with a 'Draw-like' toolbox attached to the left hand side. This contains icons of the more commonly used features such as record/playback and zooming. A more detailed list of options can be obtained by calling up a menu with the menu button on the mouse.

The first thing that strikes you about *Armadeus* is its simplicity and ease of use. People familiar with other Risc OS packages such as *Draw* and *Paint* will have no problem getting to grips with the front end.

ROCK ME, ARMADEUS

Loading data is just a case of dragging the relevant file from the directory viewer to the *Armadeus* window. If the file is not recognised as a sample, *Armadeus* asks whether you wish to load it anyway.

It is therefore possible to load any file you want. The set of 'Creations' samples available from Electro Music Research load immediately. It is even possible to load data from other computers.

Atari ST discs can be read from within *Armadeus* or by using a separate program. If a file is too large for the available memory, a small window appears with a rectangle representing the complete file. A slider bar is used to select the part of the file you wish to load.

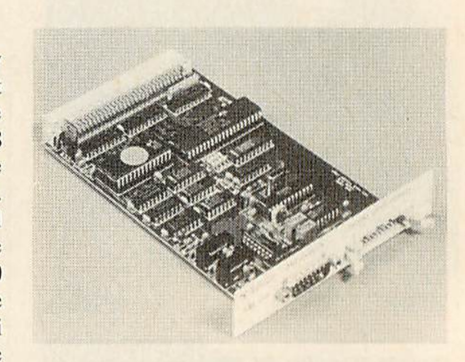
A number of conversions can be applied to data once it has been loaded. Signed and Log to Lin conversions are provided for this purpose. ST samples need converting as they are stored in a different way to the Arc. Sounds from the Commodore Amiga are also catered for (given you have the necessary transfer equipment).

MORE HARDWARE

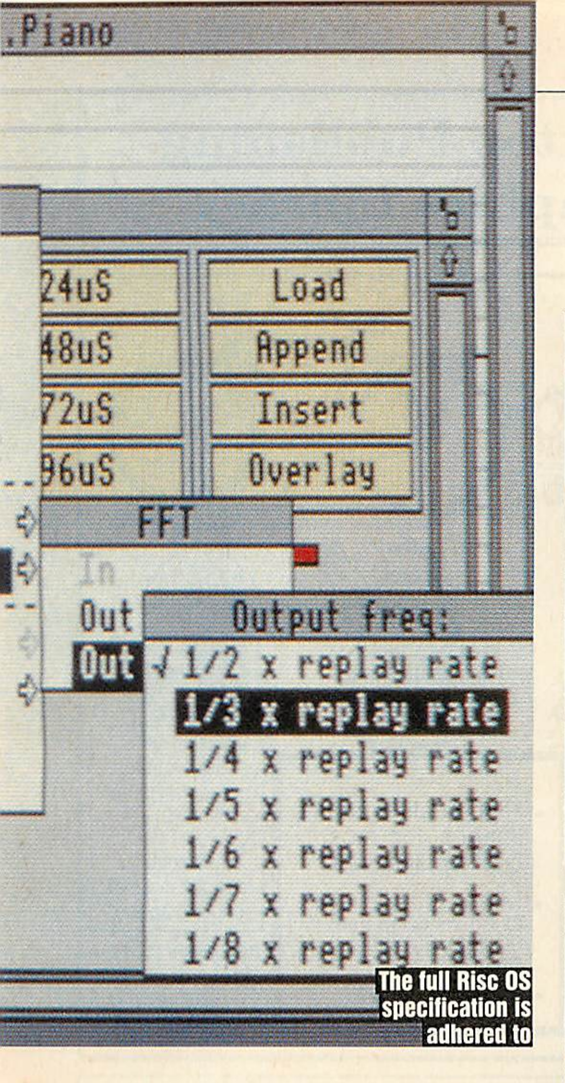
As well as being able to load virtually any type of file, *Armadeus* will work with most of the samplers available. At present, the *Armadeus* sampler, the Armadillo A448 and A448b samplers, the Unilab Interface and Wild Vision's 1208 are all supported. The manual states that other samplers will be covered in later releases of the software (The issue reviewed here is v1.00 03/07/89). Samplers not covered yet are EMR's Sampler-8 and Brainsoft's Multi I/O podule. Lets hope they get the *Armadeus* treatment soon, as both suffer from mediocre software which mars otherwise excellent products.

SAMPLING

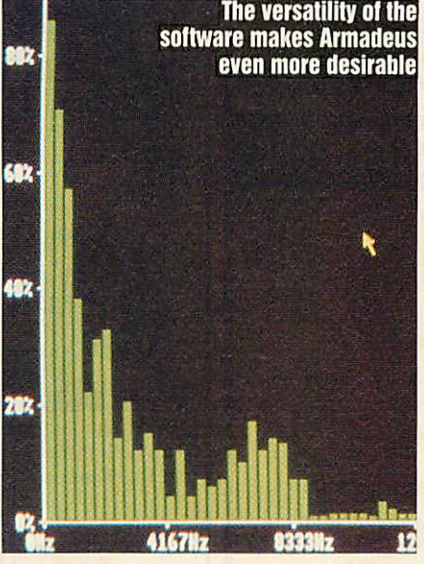
Sound capture (sampling) follows a similar procedure for each of the aforementioned boards. Some have their own peculiarities and *Armadeus* provides extra facilities to accommodate these. Basically it's just a case of setting the sample rate (between 3.92kHz and 83.33kHz), the length (in seconds) of the sample and then clicking on Record. *Armadeus* then appears to 'hang-up' completely during the sampling time. Some kind of indication that sampling was taking place would be useful; even the 'hour glass' pointer freezes!



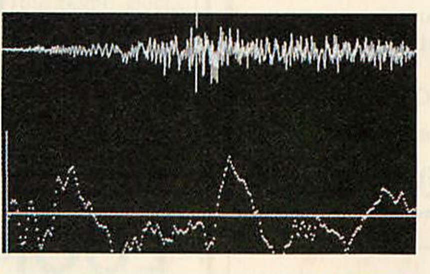
Once in the Arc, data can be manipulated in a number of ways, the most basic of which is cut and paste. The main part of the *Armadeus* window shows a graphical representation of the present sample. Any area can be selected (or marked) by pointing to

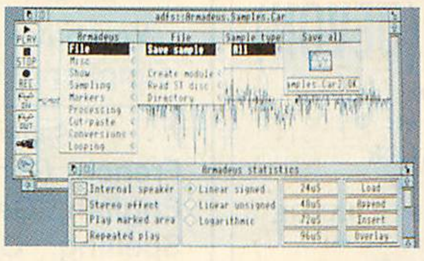


The full Risc OS specification is adhered to



The versatility of the software makes Armadeus even more desirable





Rob Miller sounds out Clares' blockbusting Arc sampler package and gives a few pointers to it's effective use

it and dragging the pointer to mark the limits you wish to enforce. The marked area (shown inversely) can be moved elsewhere in the sample or removed completely. When reading in Atari ST discs, it is often required to 'cut out' various sections of the data to be left with just the sound sample. Marked areas can be enlarged to make editing more accurate in such cases.

There are a number of facilities for those who wish to add effects to their samples. Echos and fades can be applied to any marked area; even in real-time while the sound is playing. Various frequencies in the sound can be filtered out with either a high or low pass filter.

On the subject of filtering, this is achieved by a process known as Fourier transformation. The maths involved are complex and the author of *Armadeus* has done well to achieve the speed they have.

The complement to the frequency analyser is a real-time VU meter that shows the sound wave, as it's playing, on an oscilloscope-type display. Control over playback is provided through the cursor keys. The sound can be paused at any point and played backwards simply by pressing the left arrow. It would have been nice to be able to indicate the starting point using the pointer, and then moving the mouse right or left to play the sound forwards or backwards respectively.

SOUND PLAYBACK

Apart from the straightforward playback provided by above, a number of other options exist. For a start, if you have the right podules fitted, it is possible to playback the sounds through four different type of output. The simplest is the Arc's internal speaker which is only really useful for using as a monitor. The next option (available to everyone with an external amplifier) is the 3.5mm jack socket installed as standard on the Arc.

Sound can also be played back through either the *Armadeus* sampler podule as mentioned above, or through the Unilab Interface with the necessary connections.

As well as having varied output, it is also possible to physically play back the sounds in a number of ways. A 'Play' button on the toolbox window will play the whole sound or part of it if it is marked. Alternatively, the Arc's keyboard can be changed into a two-octave piano-type keyboard. Sounds played back using this method sound quieter than the former for no apparent reason, although this doesn't really detract from the feature.

If you are fortunate to have an Acorn midi podule fitted, plus a midi keyboard, samples can be controlled via midi. This allows you to play the sounds over the complete frequency range. Up to eight voices can be used for playback although the playback volume decreases as the number of voices increase.

GOING FOR A SONG

The final section of *Armadeus*, is the creation of songs. This involves the specifying of loops within samples to build up a 'longer' sample. Any section of a sample can be defined as a 'loop' and then entered into the 'loop sequence'.

Each loop can be repeated as many times as required, allowing songs of roughly any length to be compiled. An example is provided on one of the *Armadeus* sample discs (two of which are included in the price) and 'stretches' an actual sample length from 30 seconds to 1.5 minutes. Loop sequences can be edited and songs can be played back in similar ways to samples.

THE VERDICT

Really, I can't think of anything you would want to do to a sound that *Armadeus* doesn't already do. Virtually every feature possible has been included in the software.

Running under the Risc OS desktop environment, it is easy to use and very simple to master for people familiar with other Risc OS programs.

With the promise of an *Armadeus II* and other related software (such as sequencers, drum machines and light-to-sound), Clares has a real winner on its hands and deserves to sell as many copies as there are samplers out there in 'userland'.

The Armadeus software costs £79.95 and the Armadeus (hardware) £149.95 from Clares Micro Supplies, 98 Middlewich Road, Rudheath, Northwich, Cheshire CW9 7DA.

The Sampler 8 (with Soundsynth) costs £126.50 from EMR, 14 Mount Close, Wickford, Essex SS11 8HG.

The ADC1208 sampler costs £569.25 from Wild Vision, 6 Jesmond Road, Newcastle upon Tyne NE2 4PQ.

The Armadillo A448 and A448b MIDI samplers cost £189.75 and £224.25 respectively from Armadillo Systems, 17 Glaston Road, Uppingham, Leicestershire LE15 9PX.

MASQUERADE

Some 24-pin printers have an eye on far greater things. MALCOLM BROWN takes a look at one model which has a particular knack for social climbing

In the same way as 9-pin dot-matrix printers improved their print quality by printing in two passes – to create 'near letter quality' (NLQ) text so the same idea is now being applied to 24-pin printers. The Star XB24-10 uses two-pass printing to emulate a 48-pin machine.

Printing each line twice not only effectively doubles the number of pins in the printhead but also severely reduces the speed. That's why 24-pin printers were created in the first place – to give quality better than 9-pin NLQ at a speed approaching 9-pin draft.

Epson's TLQ-4800 was the first (and only) 48-pin printer and it offers even better quality than 24-pin machines (see *BAU* August 1989). However, it costs £2500 so Star has produced the £599 XB24-10 24-pin printer which can imitate it.

Like the NLQ 9-pin machines, the XB24-10 has an additional two-pass printing mode to effectively double the number of pins to 48, but at a 24-pin printer price.

Physically, the XB24-10 (and the £789 wide carriage XB24-15) is much like any other 24-pin printer. It has a push feed tractor unit built-in for fanfold paper and friction feed with efficient automatic paper loading for cut sheets. Switching between the two is simple enough with a single button push to 'park' the fanfold paper out of the way ready for a cut sheet.

The XB24-10 is compatible with both Epson's LQ standard of control codes and IBM's Proprinter so it will do most things and can be used with software.

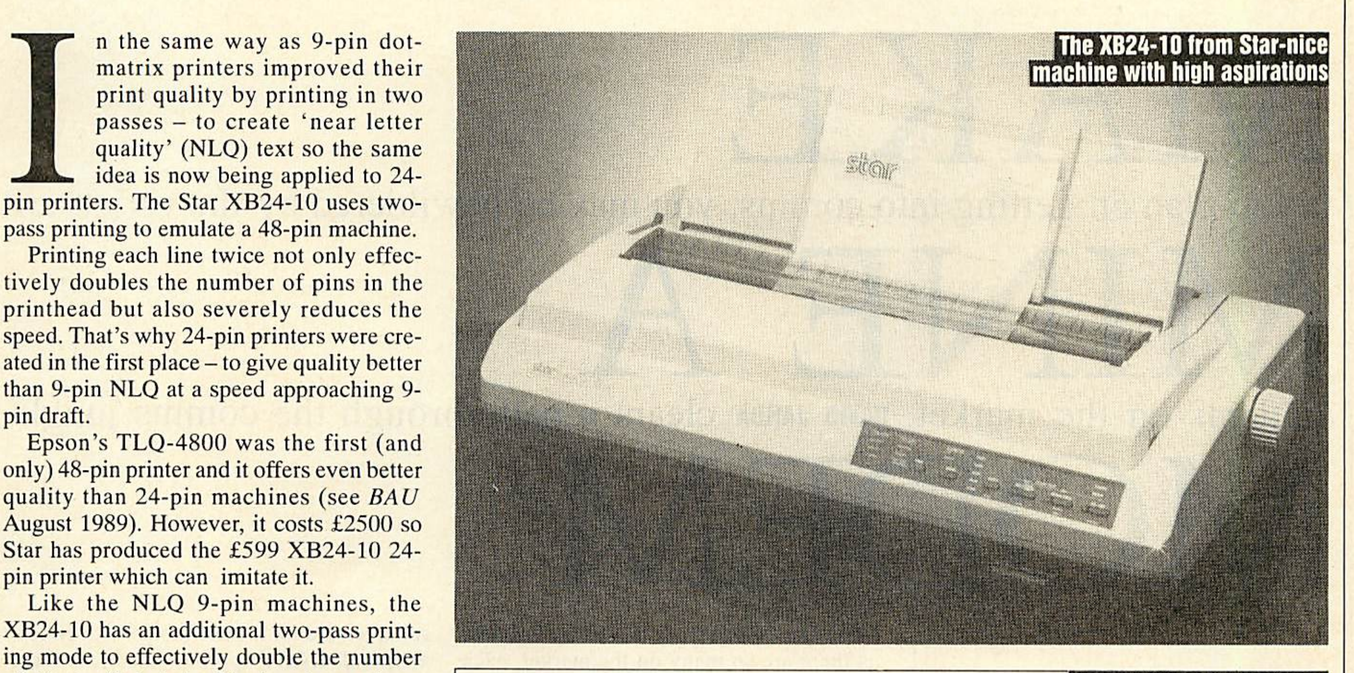
This printer uses fiddly Dip switches to choose the emulation but other settings are altered on a printed menu from the front panel like most 24-pin models in this price range. Most other functions of the printer can be controlled from here too and the layout and innumerable indicator lights make the controls simple and obvious to use.

Like other printers, the XB24-10 has a speedy draft printing mode. The print is poor quality but it is fast. A measured speed of 125CPS was achieved in this mode.

The normal one-pass NLQ mode is of course slower (it measured 49CPS – under a minute for an A4 page) but produces extremely good print – better than many other 24-pin machines.

There is a choice of seven styles of character in this mode too. These range from the normal typewriter look-alike to a fancy 'cinema' style. All the styles are produced to the same quality and at the same speed.

If these are not enough then extra styles can be added with £49 plug-in cartridges.



The XB24-10 from Star-nice machine with high aspirations

Fares well on comparison

Make & Model	Price (+VAT)	Print width	Claimed speed Draft	Claimed speed NLQ	Average speed Draft	Average speed NLQ	Interface Centr.	Interface RS232	Sheet Feeder	Auto Load	Emulations Epson	Emulations IBM	Built-in fonts	Plug-in fonts
Citizen HQP-40	£559	80	200	66	114	46	•	•	£150	•	•	£50	1	£35
Epson LQ-850	£659	80	220	73	136	57	•	•	£165	•	•		2	£55
Epson TLQ-4800	£2199	136	250	83	125	55*	•	•	£449	•	•		9	
Fujitsu DL-3300	£599	80	240	60	115	49	•	£25	£166	•	•	•	1	£69
NEC P6 Plus	£649	80	220	75	130	56	•	£85	£125	•	•		6	£45
Panasonic KX-P1124	£399	80	160	63	94	40	•	£69	£119	•	•	•	5	
Star XB24-10	£599	80	200	67	125	49	•	£69	£100	•	•	•	7	£49

* 48-pin speed

Choose between seven fonts

♥♦♣♠!"#$%&'()*+,-./01
23456789:;<=>?@ABCDEF
GHIJKLMNOPQRSTUVWXYZ[
COURIER PRESTIGE
TIMES TW-LIGHT
SCRIPT **CINEMA**
HELVETICA

SLQ TIMES SLQ TW-LIGHT

In the two-pass 48-pin emulating mode (which Star calls 'super letter quality' – SLQ) the choice is just two character styles although, again, extra styles can be added with cartridges. The speed in SLQ is reduced considerably to 26CPS.

The only problem is that the SLQ print is not enormously different to the normal NLQ. True, it is sharper and finer but the difference is not easily detected.

The quality of the 'normal' NLQ is quite good enough to make this small improvement more trouble (and more time consuming) than it's worth.

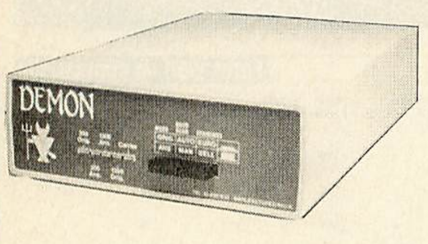
It is this one feature that sets apart the XB24-10 and it really doesn't add enough to the normal NLQ quality to be considered anything more than an interesting extra.

All of which leaves a normal 24-pin printer. Perhaps the XB24-10 should indeed be judged purely as a mid-priced 24-pin printer. It produces excellent 24-pin print at a good speed and in a variety of styles. It is well made and sensibly designed with a clear and simple control panel.

Considered just as an ordinary 24-pin printer, the XB24-10 has much to commend it and the addition of the 'SLQ' mode can only be considered an added extra.

MAKE MINE A MODEM

If you plan on getting into comms, you may be bewildered by the variety of modems on the market. **DAVID JANDA** clears a path through the comms jungle





Choosing a modem can be a tricky business as there are so many on the market, each boasting one type of feature that is better than any other.

Selecting what is right for you depends on what you wish to use the modem for. If you are new to comms, or you would like to just call up viewdata systems such as Prestel then a cheap second-hand model can be picked up for around £25-£50.

However, if you have caught the comms bug and would like to use a modem on a regular basis to access the hundreds of bulletin boards scattered throughout the country then you should consider one of the more expensive models.

Speed and functionality are the two aspects which determine how much a modem will cost. The speed at which a modem operates determines how much data can be transferred in a given time. A modem operating at 300 baud will transfer 30 characters per second. One operating at 2400 baud will transfer 240 characters per second – divide the speed by 10 to get an average transfer rate per second.

Choosing a modem that operates at 2400 baud may be expensive, but if used on a regular basis over a short period of time it can save you money as data is transferred that much faster, thus saving telephone bills and on-line time charges.

Functionality also costs money. Manual-type modems that require the user to press buttons or turn switches are cheaper than their automatic counterparts which are operated through your communications software and are easier to use.

Features such as auto-dialling, auto-answer and automatic baud rate detection are not essential, but do make life easier. The rule is that you pay for what you get.

If you are new to the world of comms and are considering a second-hand model then do make sure it works. Do not take a seller's word for it. Also look out for BABT approval. BABT approval means that the modem is approved for use on the telephone network. It does *not* mean that the modem is functional though - a point worth bearing in mind.

NIGHTINGALE

Two modems attracted Acorn users in the early days. The first was the original Demon and the other the Pace Nightingale.

Both modems are out of production, and in the case of the Demon it never achieved BABT approval. Although quite old, the approved Nightingale is a good second-hand purchase if you get it for under £40.

The outstanding feature of the Nightingale at the time of its launch was its reliability. The modem is well built and does not overheat when left on for long periods of time. A good thing too, as there is no power switch.

The modem is of the manual pulse dialling variety with a telephone jack socket at the rear. A well laid-out front panel with three buttons (four on the unapproved model) and three LEDs gives the user full control of the modem's operation. Early unapproved models had a fourth button which enabled Bell tones at 300 baud. Later models had this disconnected.

The Nightingale is still very popular with bulletin board users as it can operate at 75/1200 baud, also known as reverse Prestel. An unapproved auto-dial, auto-answer accessory board connected to the user port on the model B extends the features of the modem. However, auto-answer at 75/1200 could also be achieved on the standard model by setting up your terminal software and pressing the modem connect button. Once the phone rang the modem would auto-answer!

I highly recommend this as a second-hand purchase.

	Nightingale	Enterprise	Dataphone	Microlink	Demon 4
BABT approval	(4)	(4)	(4)	Y	N(3)
300/300	Y	Y	Y	Y	Y
1200/75	Y	Y	Y	Y	Y
75/1200	Y	Y	Y	Y	Y
1200/1200				Y	Y
2400/2400				(2)	Y
Auto dial/answer (1)		Y	Y	Y	Y
Auto baud detect (1)			Y	Y	Y
Hayes compatible				Y	Y
Number store	0			Y	
MNP				Y	
Phone socket	Y	Y	Y	Y	Y
Speaker			Y	Y	Y
Tone/pulse dial	P	P	P	T/P	T/P
Price	£30-£50	£25-£40	£115	£169	£289

(1) Requires optional unapproved auto-dial/answer board (2) Pace, manufacturers of the Microlink multi-speed modem (Linnet 120 0) also produce a Linnet 2400 at £386. (3) Dataphone, manufacturers of the Demon 4 also produce an approved version of the Demon 4 at around £460. (4) Early versions of these modems are not BABT approved.

MAGIC MODEMS

There are quite a number of modems with similar specifications and hardware designs on the second-hand market.

Take the Datastar Magic modem. To be avoided at all costs due to lack of reliability, it spawned a number of clones, which in their way tried to make up for the original's failings. One such offering is the Voyager 7 from the now-defunct Modem House.

The Voyager 7 is BABT approved, but not for the auto-answer feature which it boasts. Not that it mattered much as many models failed to auto-answer (and dial for that matter).

Kirk Automation (now defunct) took up on the Magic design and released a number of improved models under the Enterprise label. The Enterprise 1 achieved BABT approval and boasts a more reliable auto-answer, auto-dial. The Enterprise series also has an in-line phone socket at the back.

Common to the Voyager and the Enterprise modems is the speed select rotary switch, power button and LED setup.

Both modems have an internal power supply and pulse auto-dial which has a very loud relay.

The major problem with this type of modem is reliability. When buying a second-hand modem make sure that the thing works in the first instance. Do not pay more than £25-£30.

DESIGNER

The Pace Nightingale, Voyager 7 and Enterprise modems are manual in most respects. Speed selection for incoming and outgoing calls must be set by hand.

The Designer modem from Dataphone (now defunct but sold by Modem Marketing) bridges the gap between manual and Hayes type modems.

The unit is housed in an attractive low standing grey case and is fitted with an internal power supply, in-line phone socket and 25-way D-type RS232 connector. Four buttons on the front panel control the power, speed, originate/answer mode, on-line status and internal speaker.

Operating the Designer can be done in two ways: first it is possible to use the Voyager as a manual modem where speed and such like is set by the user. Secondly a semi-automatic mode of operation is available providing the modem is used with suitable software.

Using the Designer in automatic mode is simple. Packages such as Beebug's modem Rom and the Zromm (sold by Modem Marketing) provide functions for controlling speed, dialling and answering. This means the only controls on the Designer that need to be used are the power switch and the speaker control. The latter switches on/off a small internal speaker when the modem is on-line and is useful for monitoring the status of the phone line.

If a super-reliable 1200/75, 75/1200, 300/300 baud modem packed with features is what you require at a low cost, then the Designer could be what you are looking for. Highly recommended.

LINNET

Pace Micro Technology has produced a number of Hayes compatible modems.

Three basic models are available: The Linnet operates at 300/300, 1200/75 and 75/1200 bauds. The Linnet 1200 provides 1200/1200 baud full duplex and the Linnet 2400 2400/2400 baud full duplex operation. To confuse matters further the company also manufactures the Linnet for Micronet and Microlink, two commercial databases. For the purpose of this review I looked at the Microlink multi-speed modem which is functionally similar to all the Linnet range.

The Microlink modem is a fully automatic auto-dial, auto-answer Hayes compatible modem. Unlike manual modems, such as the Voyager 7, the Microlink modem is equipped with its own processor.

Controlling all the modem's functions is achieved through the communications software. Entering terminal mode will allow the user to 'talk' to the modem using the Hayes command set which consists of a number of AT commands. Using these commands it is possible to control all the functions of the modem.

Speed buffering enables the terminal software to be operated at one speed, while the modem communicates with the host system at another. All the Linnet range (including the Microlink and Micronet modems) can pulse and tone dial. The latter is useful if your telephone exchange is of the System-X variety.

The major difference between manual and automatic Hayes modems is ease of use. Once mastered, Hayes compatible modems such as the Linnet variety are easy to use and provide the user with more control over the modem's operation than manual modems do.

HI-TEC DEMON 4

Automatic Hayes compatible modems are not the last word in modem technology. Error correction and data compression are two features many people look for when choosing a modem.

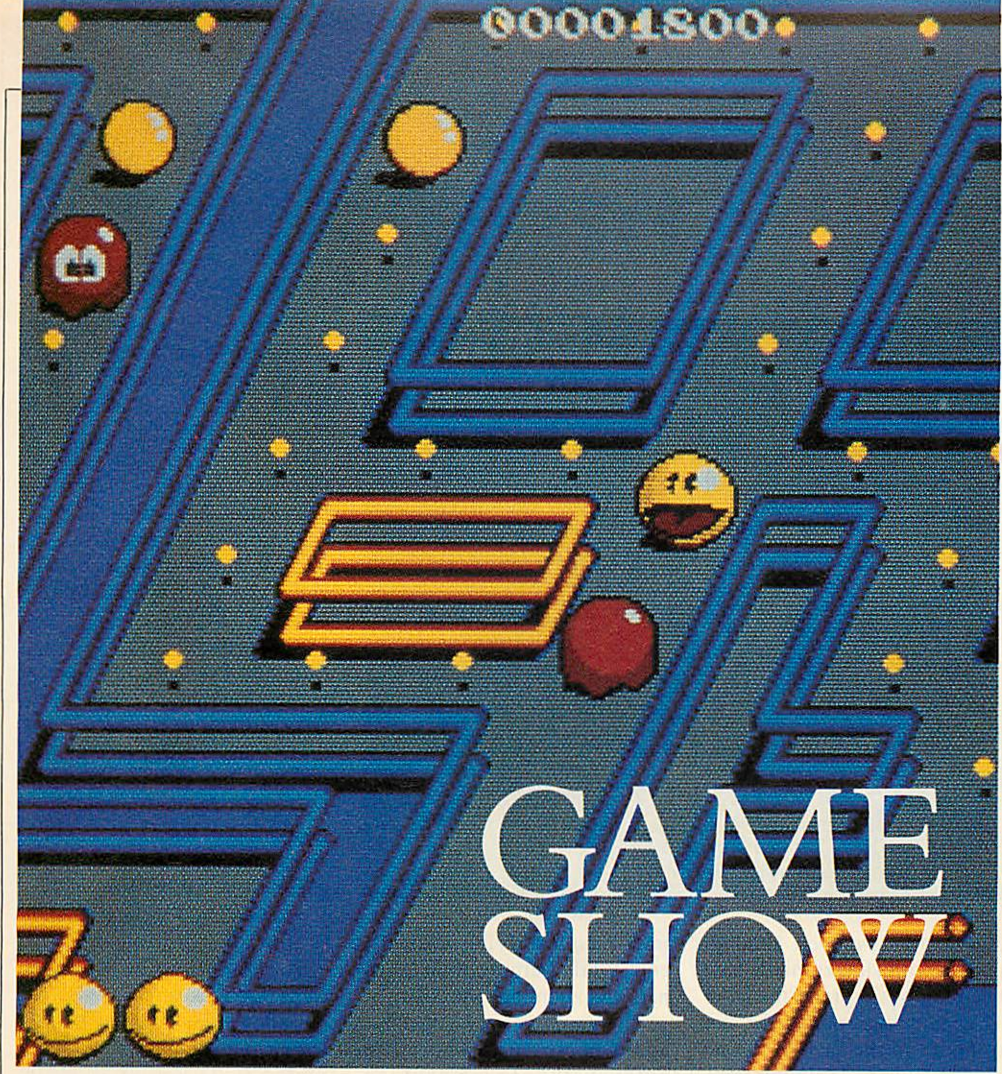
The Hi-Tec Demon 4 is a Hayes compatible modem which incorporates these new features. For Acorn users, error correction has been achieved by using file transfer protocols such as CET for viewdata, or Xmodem and Kermit. Although reliable file transfer protocols only work when transferring files, interactive sessions such as reading text files on-line are done at the mercy of the telephone line which may introduce garbage at any moment.

The Demon 4 employs the Microcom Network Protocol (MNP). Providing the host modem also conforms to this standard the two modems will provide the user with an error-free communication throughout the call. Data compression is also done 'on the fly'. Thus even if the Demon 4 is operating at 2400 baud you may get an effective throughput of up to 4800 baud. Further, both the error correction and data compression functions are transparent to the user.

The Demon 4 also features automatic selection of pulse or tone dialling and it allows the user to store Hayes command strings (including telephone numbers) and modem parameters in its battery-backed memory.

At an exceptional £289 for the unapproved Demon 4, and £460 for the approved model, they are more expensive but provide the user with error free communications and faster throughput.





GAME SHOW

It's the time of year when the reindeer are in full training for their annual post round, the red and white coat is being given a thorough seeing-to at the dry cleaners, and the *BAU* Games Pages celebrate the best of 1989 – the top games.

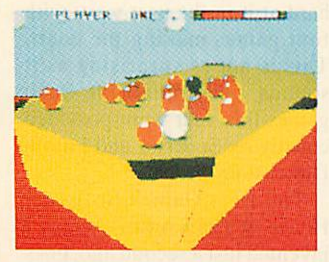
I've noticed that the Beeb market is beginning to trail off. There have been less than 30 new games in the past year, although almost as many again are 'promised' before Christmas (and probably won't arrive before Easter).

The Arc market is doing the opposite, I'm glad to say, with 25 new releases – almost more than the Beeb effort. The choices below are personal and were difficult to make. There was too much good stuff on the Arc and too little on the BBC. First, the top five BBC games.

BBC TOP FIVE

3D Pool
Firebird Tel: (0666) 504326
Graphics: ***
Addictiveness: *****
Value for money: *****
This pool game is the best simulation in the history of the Beeb and it uses a unique method for aiming the cue: you alter the axes of the table!

Written by top programmer Orlando (*Firetrack*, *Frak*), it shows once again that there is always more to get out of the machine. The also superb Archimedes version may or may not be available in the



future – it's all down to company politics. Although at the time of writing the game hasn't been released, Firebird assures me that the game will be available for Christmas.

Holed-Out
Fourth Dimension Tel: (0742) 700661
Graphics: ****
Addictiveness: *****
Value for money: *****
Bash a ball across a field and into a hole using more colours, higher resolution, sampled sounds and a mouse. The ball moves smoothly and realistically, and the game-play is virtually without fault.

My only niggle at the time of release was the predicted life



span of the two courses but since then four extra plus a course designer have appeared.

This is especially good with six players but it takes a long time to get through 18 holes!

Repton Infinity
Superior Software Tel: (0652) 58585
Graphics: ****
Addictiveness: ****
Value for money: ****



As the name implies, *Repton Infinity* has the facility, if you have the ability, to redefine the settings in almost any way – opening an enormous number of doors, provided you're willing to spend some time unlocking them.

It features its own language, 'Reptol', allowing the game rules to be changed, and also the screens and sprites. Games such as *Repton, Ravenskull, Pengo, Pipeline,* and even *Space Invaders* can all be built using the software.

Some new games designed with the package will shortly be released by Superior.

UIM
Fourth Dimension Tel: (0742) 700661
Graphics: ***
Addictiveness: ***
Value for money: ***
Futuristic civilisations battle it out under the seas in Fourth Dimension's unofficial sequel to *Elite*. Locate the Ultra Intelligent Machine and by being ultra-ultra intelligent, outwit it and solve the game.

Sounds simple enough for the average intellectual, but first of all you need plenty of dexterity to combat the advancing subs and a quick mind to manage your trading.

An Archimedes version exists but I haven't seen it yet.

The Last Ninja
Superior Software Tel: (0652) 58585
Graphics: **
Addictiveness: **
Value for money: **
This was Superior's best selling game of 1989 and as a result the 'Last' of the title does not apply to the company's release schedule. However I can't see what all the bother is about.

Don't get me wrong, it's certainly not a bad game but as you can see, I've thought of four that better it. The action is similar in concept and style to video films containing 'Ninja' in their titles – kill the other guys. The actual plot is something you think about later as you have tea.

It's been a fairly disappointing year for Beeb gamesters and the best advice I can give you is: get an Arc, particularly since



the games conference Acorn held boosted the efforts of many games companies.

And so to the Arc's entertainment year. Far more promising, with a lot of good stuff – though mixed in with much less good. The three games I have chosen are all worth mentioning in the letter to Santa.

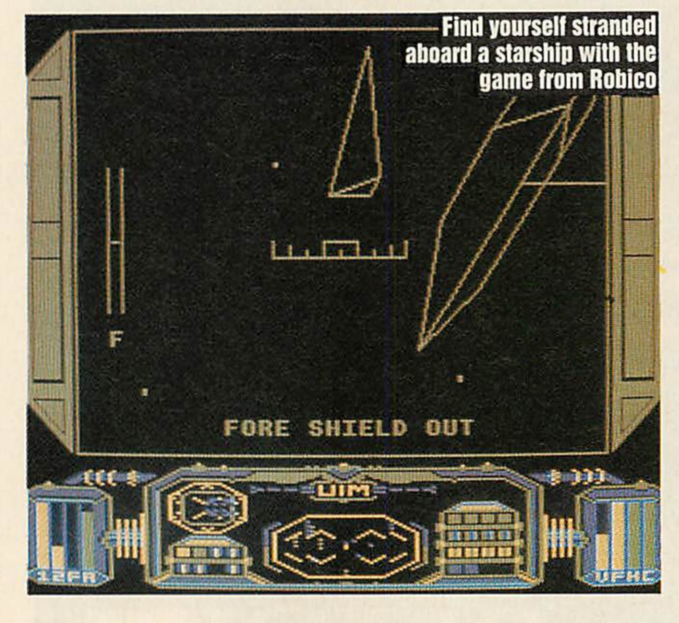
ARC TOP THREE

Holed-Out
Fourth Dimension Tel: (0742) 700661
Graphics: ****
Addictiveness: ****
Value for Money: *****
3D from 4D. The second simulation this year is the second best in the history of the Beeb! Bash a ball across a field and into a hole – sounds silly doesn't it? But *Holed-Out* is far from silly.

It's a superb implementation of one of our more sedentary sports, proving you don't need to kill aliens or Russians to get a high score. Recommended.

Pacmania
GrandSlam Tel: 01-247 6434
Graphics: *****
Addictiveness: ****
Value for money: *****
Guide a smiley ball with an opening and closing slit in the middle, through a 3D maze, all the while gobbling dots and leaping over ghosts.

It's an acceptable sequel to Acornsoft's *Snapper*, although people with slower minds have been known to prefer the latter. This game was one of the first to laugh in the face of the ST owner and smile understandingly at the Amiga buff.



Find yourself stranded aboard a starship with the game from Robico

E-Type
Fourth Dimension Tel: (0742) 700661
Graphics: ****
Addictiveness: ****
Value for money: ****
This driving game from 4D breaks its golden rule and is available on the Arc only (see the review in a minute). 'Drive recklessly' is the aim. Send traffic cones flying and kill cops while burning round corners and zooming over hills.

The game is very good but again possesses a short life without the accompanying track designer, and Santa might think twice before splashing out a full 37 quid on the pair.



Scapeghost - a haunting adventure from Level 9

It's evident from the list above the Fourth Dimension has been hard at it in the past year, with four games making the chart. This is not as surprising as it sounds – about half the Beeb games this year were provided equally by Superior and Fourth Dimension.

The Best Games Software House of 1989 Award, which I invented just a second ago, goes to – the Fourth Dimension for its brave input into the Archimedes market.

As the reviews this month don't cover all the available games here is a quick preview of some which will be ready for Christmas: *Blast* from Audiogenic (Beeb) – not brilliant, but could pass as a Christmas present, just about. *Armatron* from Z&Z Software (Arc) – this is down to the standard of BBC games, but then BBC games can be addictive, sometimes. *Confusion* from Cambridge International Software (Arc) – a bat'n'ball type game like *Arkanoid*. *Fireball* from Godax is better. And finally, *Casino Games* from Minerva (Arc).

Titles to look out for at Christmas which I haven't seen yet are: the long awaited compilation discs from Audiogenic, *Fab Four I* and *II*, containing *Thunderstruck II*, *Omega Orb*, *Pyscastria II*, *Sphere of Destiny II* on *Fab I*, and *Impact*, *Ziggy*, *Dispatch Rider*, and *Ransack* on *Fab II*. Also, *Hard Drivin'* and *Trivial Pursuits* on the Archimedes from Domark, and *3D Pinball* and *I was Kidnapped by a Flying Saucer* on the Beeb from Tynesoft. CDS has *Collosus Chess X* and *Steve Davis Snooker* in the pipeline, but they won't reach the end of the tunnel until Easter. Level Nine has completed its last ever Acorn adventure game – or so it says. It's called *Scapeghost* and is supernaturally aligned!

A year ago, *Exile* from Superior was released, but to our knowledge only one person (two including me) has completed it. If you're stuck in Triax's lab unable to get at the destinator, go to the switch just above the horizontal door at the bottom and repeatedly push it over and over again. This constantly shuts an ever-opening valve, and after a while you will find that the water level rises. Keep going until you destroy the maggot machine, when an earthquake begins and the whole complex is flooded.

Karma from Periscope Software is unlikely to be seen before Christmas. The authors don't want to make any compromises. A realistic date is as late as Easter time.

Lastly, *Pipeline* from Empire Software is going through some major improvements before its release, which out-date the review in November. The pipes will fill as you place them, and the clock begins immediately. There is also to be a wrap around effect plus a few other things. The Archimedes version, will also incorporate these improvements.

My advice this Christmas is to wait until the last minute before buying games. A lot of companies have products under development and are rushing to get them finished in time. Have fun, and Happy Christmas!

Sam Greenhill



REVIEWS

Interdictor
Clares Tel: (0606) 48511
Archimedes £34.95

The object of *Interdictor* is to beat the enemy. To do this you must capture all the airfields in the valley by destroying their defences and landing. But the 'enemy' will try to recapture the bases by sending trucks from nearby depots (although they can be shot up en-route).



However, it is dangerous to fly at 30 feet and aim downwards as many a dead pilot will tell you, so concentrating on demolishing the depots with rockets is a better idea. It is also clever to remove the bridges, again with rockets, before advancing to the next field.

The major selling point of *Interdictor* is 'its super-fast solid graphics and its incredible realism'. What graphics there are are quite good although not particularly detailed.

One is hardly thrust into a realistic situation with only a collection of pyramids and squares to keep you company. About the best visual feature is the bridge and you're expected to blow this up!

The actual maths in the program – the plotting, calculations and such like – are, to put it bluntly, not very good. In one instance it is possible to fly over two of the mountains, look through your right window and see the further of the two peaks plotted on top of the near one.

Also, rivers and roads tend to break up when you get a certain distance away. This could have been due to numeric accuracy although some provision should have been made to compensate. I can't really criticise the handling of the jet although a pilot friend of mine had doubts whether a number of the manoeuvres were really possible. Taking off and immediately putting the plane in a vertical climb does seem to be a little far fetched.

Although the plotting left a bit to be desired, I greatly enjoyed the flying and playing aspects of *Interdictor*, especially when there are missile bases and enemy aircraft to deal with.

The game is generally very good fun to play. However, the enemy headquarters at the end of the valley, which must be destroyed, consists wholly of a small, square orange box. Not only that but the end and beginning of the valley are far too close together, and the valley isn't circular! The Archimedes is surely capable of holding more than seven airfields in memory and can certainly deal with a lot more ground detail.

I very much enjoyed playing *Interdictor* but I completed it much too soon. Apart from that, not bad.

Amos V Beard

E-Type
Fourth Dimension Tel: (0742) 700661
Archimedes £19.95

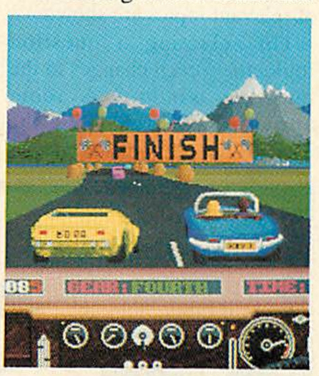
Everyone who drives well will enjoy this game. Indeed, everyone who drives badly will enjoy it too, and even those who can't drive at all will enjoy *E-Type* – the Fourth Dimension caters for all breeds of human.

Originally designed as a simulation, *E-Type* can be played with clutch, gears and other fiddly keys. Anyone not up to Mensa standards may get drastically confused so there is the inclusion of an automatic gearbox for us lesser mortals.

To begin with, *E-Type* offers a beautiful loading screen followed by detailed and simple game selection. There are five tracks to choose from, in five different climates and surroundings varying from the freezing wastes of the Antarctica to the sweltering sands of the Sahara.

Driving a 5.3 litre, 12 cylinder V-12, seventy grand E-Type Jaguar – a convertible as is customary in all car games – capable of speeds of over 200mph, you motor far more casually down the two lane track, than you would if you owned the real thing.

The graphics are first rate, the scrolling very acceptable and the overall 3D effect is convincing, especially on hilly roads. Some perks of the game are flattening PC Plod and pals and sending traffic cones into



the air, with only a minor reduction in speed.

However, hitting awkwardly placed boulders (in the middle of the overtaking lane!) is distinctly fatal. Water is also bad news and tends to end your country jaunt fairly promptly.

Your car can sustain a certain number of collisions (although it is rather degrading to watch your bumper fall off after a scrape with a pink Mini – also travelling at 150mph).

The sound is all decent samples and no annoying tunes tootling merrily in the background – the usual fare for car games. With knowledge that the samples come from Steve Botterill's very own Jag, I wonder whether the numerous crashing sounds stem from the same source?

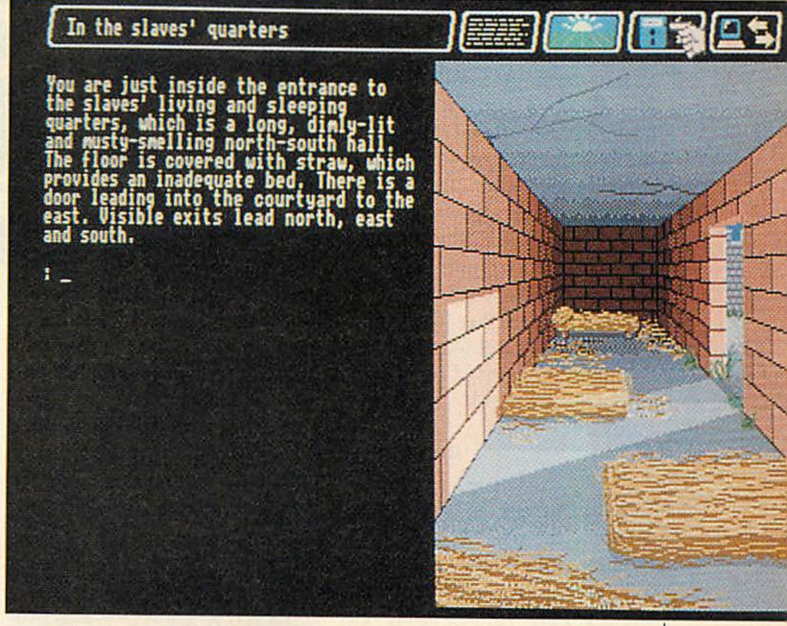
The playability is good but is hindered by the fact that control is obtained via the mouse – not a patch on the arcade steering wheel! Still, after several games the mouse becomes natural and progression past the first corner is possible.

As a supplement to the game the Fourth Dimension sells a track designer for an additional £17. This is useful and fairly necessary as the tracks provided become familiar (and, dare I say, easy) after a while.

However it is written in Basic and is unbearably slow, with a pretty bad front end, making designing new tracks rather tedious.

Overall, *E-Type* is a welcome addition to the ever growing Arc games market. The designer package does liven things up, but don't push your luck with Santa. Wait till you get your Christmas money.

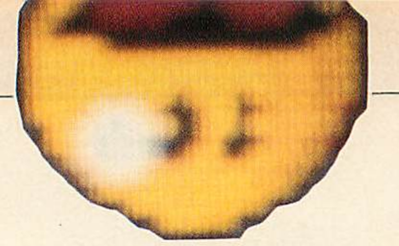
Andy Vanags



Stranded
Robico Tel: (0443) 227354
BBC B/B+/Master £17.95, Archimedes £29.95

A number of BBC games publishers have started to move into the Archimedes sector. Robico, famous for BBC adventures, has added another mega-game to the market in the form of *Stranded*.

Billed as a graphics adventure, *Stranded* finds you prisoner on board a star freighter. An ugly guard keeps watch and as



usual, there is absolutely no chance of escape.

If you're patient, you can escape, take over the ship and even (crash) land it. Once outside the ship, keep an eye out for possible assailants and never turn your back on anything. Anyway, enough of the plot. How does it look?

The graphics (Arc only) are sparse although what there is, is good. Mode 12 is used effectively throughout to provide an evocative sense of 'being there'. Especially good were a straw-thatched barn and the entrance to a mine.

A nice touch is the use of vertical pictures as well as horizontal ones – that is, ones that take up the left or right hand side of the screen rather than the upper section.

Pictures were held on the disc as complete sprites, and I would have thought it better to compress them in some way so that more sprites could be fitted in the game.

The mouse can be used to access the more familiar commands (in a similar way to Magnetic Scrolls adventures), the most useful of which was the 'save game to buffer option'. This allows you to store up to nine different positions in Ram, without the need for messy disc swapping.

The price is rather steep and I would suggest Robico reassesses this in the light of other current releases. All in all, an enjoyable game.

Rob Miller

Trivial Pursuit
Domark Tel: 01-780 2222
Archimedes £29.99

What more could one want than the ultimate yuppie game, to play on the ultimate yuppie computer? *Trivial Pursuit* has now arrived on the 32-bit scene from Domark and promises to be the first of a number of conversions to Acorn's 'ultimate games machine'.

Booting the game from the (Risc OS) desktop gives a simple loading screen, followed by graphical representation of the *TP* board. Up to six players can then type in their names and the game begins.

Dice throwing is simulated with an ever-changing die which can be stopped by pressing a mouse button. Possible squares are marked on the board with an X and a number of relevant topics are shown.

On selecting a question topic, the screen changes to the question window. A room appears in which 'TP', the Trivial Pursuit question master lives. He asks you the relevant question in a sqeaky voice (it's also printed) and then proceeds to walk up and down until you give an answer.

Questions can be one of three types – textual, graphical or musical. Textual questions are



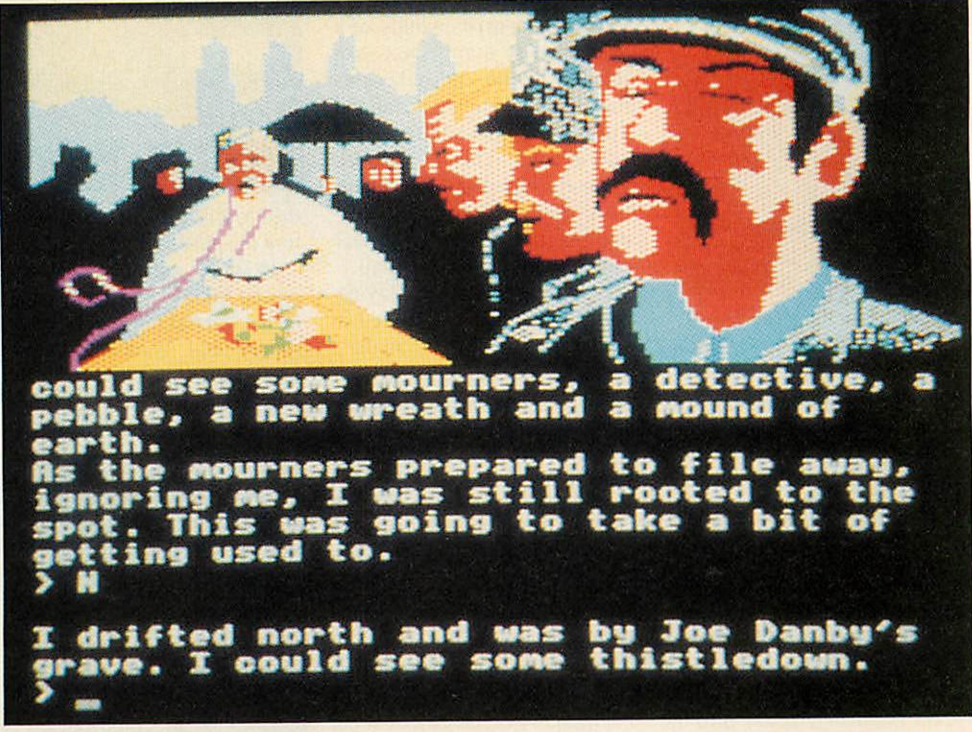
just straightforward written ones. With graphics, a displayed picture forms the basis for a question and for music questions, a tune is played.

Play continues until one player has collected six pieces of pie (or cheese).

As an alternative to the board game, *Trivial Pursuit* on the Archimedes works relatively well. Some of the questions seemed to repeat themselves after a few games. Also, a number of the questions were aimed specifically at home computer owners.

Apart from that, an enjoyable game and one of the best currently available for the Arc.

Rob Miller



Scapeghost
Level 9 Computing Tel: (0934) 814450
BBC B/B+/Master £14.95

Just when you thought it safe to go back to your keyboard, Level 9 releases yet another adventure for the BBC micro. *Scapeghost* is (unfortunately) the last adventure game to be written by Level 9, and is hailed as the best yet.

You play the part of a dead policeman, framed for his part in a drug smuggling ring and you must clear your name within three days.

Being a ghost, you start off your adventure in a graveyard, with a motley collection of ghosts to keep you company.

What it really boils down to is three separate games which are best played in the obvious order. The first section is in the graveyard, the second in a haunted house and the third involves a poltergeist.

The location descriptions are quite sparse, although the atmospheric graphics go a long way to compensate for this.

All text is printed in first person singular – 'I was standing ...' and 'I could see ...' This can be a bit difficult to get the hang of at first, but becomes easier as play progresses.

On the graphics front, dithering is used to excellent effect to give shading and apparently more colours than would normally be available in mode 2.

Where most programmers would have compromised and used either mode 2 graphics or mode 0 text, Level 9 has used both and also made an excellent job of it in the bargain. It's possible to have mode 0 text and a scrollable mode 2 picture, on screen, at the same time! There is also the option of mode 4 text if you're using a TV set.

Game play itself is quite good. There are one or two moments when the parser has difficulty. In one case, the command 'Examine statue' gave 'You could not see a statue', when the description clearly stated 'You could see a statue'. Maybe the world's first schizophrenic parser? Oh well.

Nice game. Good descriptions. Excellent graphics.

Rob Miller

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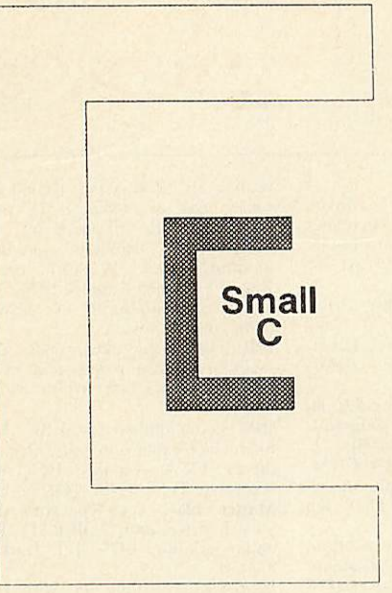
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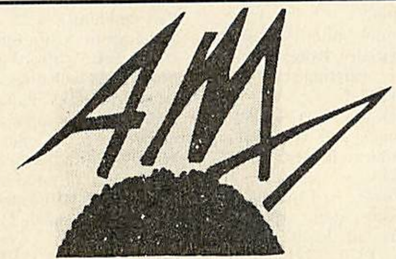
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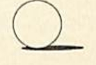
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Dr. Wann and a non-disabled helper demonstrate the system

IT'S YOUR MOVE

CHRISTINA NEAL finds out how playing games on the Arc helps physically handicapped children



For the physically handicapped children at Meldreth Manor School in Cambridge, there are plenty of leisure activities to take advantage of. The centre, one of several in the country funded by The Spastics Society, offers swimming and horse-riding facilities which can only make the children's lives more enjoyable.

Nevertheless, many still face the frustrating task of struggling to communicate with the rest of society.

Someone who has spent the past two years working hard to overcome the problem for these and other children is John Wann, a Doctor of Psychology.

Working from the Applied Psychology Unit at the Cambridge based Medical Research Council, John initially began studying human movement and body control but it was when he focused his studies purely on the movements of physically handicapped children that he found himself devising games on his Arc 310 to help improve their self-control.

John has now moved from The Medical Research Council to Edinburgh University to pursue similar studies. He explained the communication problems the children face.

'Physical handicaps put up a big barrier for education which is sad because some of the children are quite bright.

The problem is that many can't speak and if they can't rely on their hands to express themselves, their communication skills are very limited.'

John feels that rudimentary methods aimed at helping the children communicate are also limited. Consequently, he has encouraged the use of computers to enable them to express themselves more freely.

'The children can use symbol boards which sit on their wheelchairs and contain a list of activities which they can choose from', he says 'but it doesn't work to simply give someone a series of options and see which one they make the most noise at – what you want them to do is actively communicate their wants, thoughts and needs.'

The centre now owns about 20 computers, including BBC micros and Masters. However, because some of the children have cerebral palsy, controlling their muscle movements can be problematic.

It also means their arms are prone to unwanted movements which often can't be controlled.

Despite their difficulties, John's work has allowed the children to make the most of computers.

'They use peripheral sensors to pick up joint movement', he explains. 'These have a thin wire running through the middle and strain gauges on either side which go up the bend in the wire and give an electrical signal when the wire bends.

These peripheral sensors can fit onto a child's arm or shoulders.'

Although John freely admits that he's no computer wizard, he has managed to devise interesting games with simple fun exercises to help the children grasp the basic concept of control.

'I got an Arc 310 when they first became available and it's been invaluable', he says. 'I bought it for the sound and graphics so I could use them in the games, but the speed is amazing. The games are simple because common abilities are very limited – an action packed fast-moving *Zarch* game would be too difficult from the control point of view.'

One game in particular, where the user must keep their car safely on the road, is geared towards producing very accurate movements.

As the car starts slowly you have to flex it and if you overshoot it goes careering off the road. So it helps the children control the way their hands accelerate and deccelerate in a more reliable fashion.'

Other games picture the outside of a spacecraft which the user must circle around without crashing into it and a simple ball game where the user must bounce the ball over a fence.

If they bounce it too low, it won't go over but bouncing it too high could make it go too far.

Overall, the games are simple but the logic behind them is shrewd.

'If they make jerky movements, they won't achieve the objectives of the games', says John. 'They're intended to help children understand the concept of fast and slow, and up and down.'

'Hopefully we've been successful. What we're not trying to do is make the children behave perfectly normally.

There's no way the human motor system of a handicapped child can produce normal movements.

The children know they've got a problem but certainly if these games help them learn to control the velocity of their limbs then that's a step forward.'

Thanks to John's hard work, the less fortunate are gradually learning how to gain a better control over their movements.

In the long term, it can only take them closer to achieving a blessing which most of us take for granted – the gift of being able to communicate with others.

THE M·I·N·E·R·V·A COLLECTION

Archimedes Games

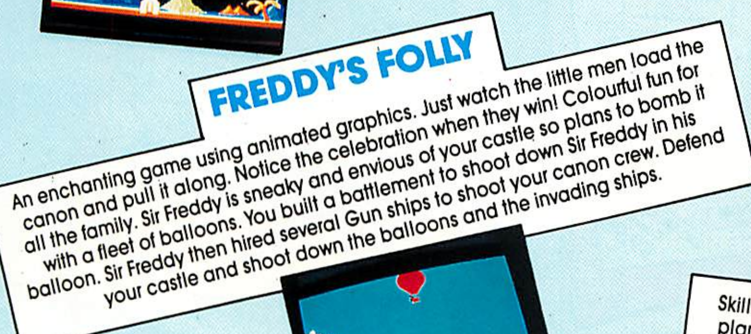
JET FIGHTER

Alone on a forgotten planet you must defend yourself against all comers whilst rebuilding your broken rocket ship, then fuel it and take off to the next level. With the aid of your jet-powered backpack you move around to collect the various parts of the rocket. You must avoid collision with all other objects. Build and then fuel your rocket to take off to the next level. Absorbing fun for all the family.



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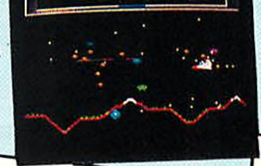
An intriguing new game with a variety of ways to achieve the ultimate goal of recapturing the Lonesome Monk's Monastery from the grip of the Evil Demons. Lead The Lonesome Monk's army through the labyrinths of the Monastery and recapture all the great treasures hidden in the building. Keep your eyes peeled for the secret passages. You too could walk through walls!



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An enchanting game using animated graphics. Just watch the little men load the canon and pull it along. Notice the celebration when they win! Colourful fun for all the family. Sir Freddy is sneaky and envious of your castle so plans to bomb it with a fleet of balloons. You built a battlement to shoot down Sir Freddy in his balloon. Sir Freddy then hired several Gun ships to shoot your canon crew. Defend your castle and shoot down the balloons and the invading ships.





ORION

Skillfully manipulate Orion, the latest air to air combat interceptor, to defend your planet against the tide of marauding aliens. Shoot them down before its too late! Score points by saving your men before they are changed into mutants - otherwise they will turn against you. Contains Baiters, Pods which explode into Swarmers and waves of Bombers. Orion is a fast and furious scrolling 'shoot em up' game based on the all time arcade classic.

MISSILE CONTROL

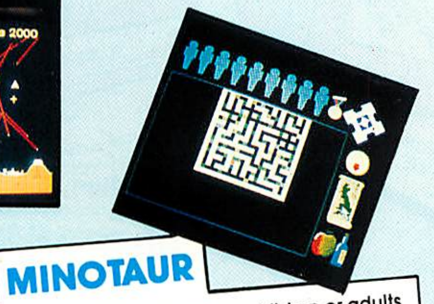
Missile Control is a classic arcade game written for the Archimedes to make full use of the advanced graphics and sound, while remaining faithful to the original concepts of the game. The Player is in control of the missile launches and must do the utmost to protect the cities from the incoming missiles. On each subsequent attack further planes, satellites or 'smart' missiles attack the target cities.



HOVERBOD

Hoverbod is a traditional maze adventure in the style of the classic Manic Miner, yet it is of stupendous proportions. Hoverbod, the yellow sperical droid, has been banished from the planet Zingle and goes in search of some stolen treasure. The player must guide him through the perils which befall him and help him puzzle his way through the eight different levels to the final quest level. But beware . . . the Ibbles and Squibbles start to materialise!!!!





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The Minotaur maze game is aimed at a market for children or adults who want a game where quick shoot-out reactions are not necessary. Theseus walks around the Labyrinth, collecting items to assist in the search of the ill fated men which have been provided as food for the Minotaur. The ultimate aim is then to kill the Minotaur and lead the men out of the Labyrinth to safety. The maze size is fully definable by the User. Games may be saved and reloaded for use at a later time.



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